ELECTRICAL CONTRACTING

ENGINEERING • INSTALLATION • REPAIRING • MARKETING

SEPTEMBER
·1935·

N. E. C. A. CONVENTION ISSUE

Special Sales Section

containing 16 practical suggestions for creative marketing of electrical contractors' services.

Next Month

REPORT ISSUE

Containing complete digest of papers and reports made at N.E.C.A. Convention at Chicago, Sept. 23-25

UMI

ANNOUNCING A NEW G-E TIME SWITCH



G-E Type T-17 time switch

More widely useful... low in first cost, installation, and maintenance. Profitable for contractors

TWO years of development have gone into the making of this new G-E time switch. Our engineers, working in conjunction with our General Engineering Laboratory, have produced a simpler and more widely useful switch.

It offers you greater opportunities for profit. Its increased capacity fits it to handle alone many jobs that formerly required, in addition, contactors. This saving increases your opportunity for installing controlled show-window, store, and sign lighting. In the new jobs that these switches open up, you profit on the switch itself, on the wiring, fixtures, and accessories.

You can get further details about this new time switch from the nearest office of the G-E Supply Corporation, the nearest G-E sales office, or direct from General Electric, Dept. 6A-201, Schenectady, N. Y. Ask for a copy of Bulletin GEA-1427D.

FEATURES

Telechron motor timed and powered.

Double-pole switch, 80 amperes; triple-pole, 120 amperes—split load. Saves cost of contactors.

Convenient knockouts; connecting lugs furnished—installation is easy.

Heavy silver contacts—will last for years.

Six forms, for either clock or sun schedule.

Can be mounted in swinging signs—indoors or outdoors.

A similar switch, the T-27, for indoor use only, is available at a lower price.

440-65

GENERAL ELECTRIC

S. B. WILLIAMS
Editor
F. J. SEILER
Assistant Editor

HOWARD EHRLICH
President
GLENN SUTTON
Manager

ELECTRICAL CONTRACTING

Vol. 34 SEPTEMBER - 1935 No. 11

Established 1901
Official Publication
of the
National Electrical
Contractors Association

INSTALLATION
ENGINEERING
MAINTENANCE
REPAIRING
MANAGEMENT
MARKETING

for

ELECTRICAL CONTRACTORS
INDUSTRIAL
COMMERCIAL
RESIDENTIAL

ELECTRICAL INSPECTORS
ENGINEERS
SERVICE SHOPS

and others engaged in the business of electrical construction

MAIN LIBRARY

CONTENTS

Selling to be Dominant Note at N.E.C.A. Convention 6
Thirty-Third Annual Convention Program 7
Fire Prevention Week 7
The Inspector Expects Support. *By George Welman* 8
Silk Mill Modernization 9
Thirty-Five Lumens Per Watt. *By Dean M. Warren* 10
Outdoor Meter Plan Creates $85,000 Business 12
Switchboard Installation Costs. *By Ray Ashley* 13

Sixteen Sales Suggestions 15

1. Sells Guaranteed Savings 16
2. Sells Through Service Contacts 16
3. Production Insurance 17
4. Power Surveys 18
5. 200 Store Front Jobs 18
6. Found Opportunities in Small Community 19
7. Knowing Customers' Problems 20
8. Boosts Sales with 3 Light Lamp 21
9. Analysis of Industrial Sales Approaches 22
10. Ways to Hold Speculative House Wiring 24
11. Appliance Sales Boost Wiring Sales 24
12. Better Light—Better Sight Opportunities 25
13. Builds $5,000 Monthly Volume 26
14. Studies Ventilation 27
15. Campaigns for Wiring Business 27
16. Builds Wiring With Oil Burners 28

DEPARTMENTS

Construction Methods 29
Service Shop Practice 53
Code Chats 58
Editorials 64
Contracting News 66
Roll O'Tape 74
Manufacturers' Bulletins 79
New Products 81

Advertisers' Index *84*

Published Monthly by
The Electrical Trade Publishing Co., 330 West 42d Street, New York
520 North Michigan Ave., Chicago **501 Guardian Building, Cleveland**

Member Associated Business Papers, Inc., and Audit Bureau of Circulations. Also Publishers of Mill Supplies and Electrical Wholesaling. Subscription: U. S. $2; Canada, $2.50, including duty. All other countries, $2.50 per year. Single copies 25 cents. Entered as second class matter February 20th, 1935, at the post office at New York, N. Y., under the Act of March 3, 1879. Copyright 1935—Electrical Trade Publishing Co.

UMI

Welcome to the Convention ...Members of NECA!

PARACORE SAFECOTE BUILDING WIRES AND CABLES

EONITE WIRES AND CABLES

ALL GRADES OF RUBBER INSULATIONS

RUBBER POWER CABLES OF ALL DESCRIPTIONS—PLAIN —BRAIDED—LEADED

"U. S." ROYAL HEAVY DUTY PORTABLE CORDS AND CABLES

FLEXIBLE CORDS OF ALL TYPES: ZIPCORD, RUBCORD, USCORD

RUBCO LINE OF PACKAGED CORD SETS

BARE AND WEATHERPROOF WIRES AND CABLES

LAYTEX INSULATED WIRES, CABLES AND CORDS

You are to be commended on your far-sightedness in making this Convention possible.

It is a healthy sign when leaders of industry are recognizing that economic conditions are demanding a different type of selling today.

"U. S." pledges you the highest type of product and service it is capable of producing. It assures you of its wholehearted cooperation at all times —it wants to take this opportunity to express to you its appreciation for your support in the past and in the future.

The "U. S." line of insulated wires and cables, friction tapes and splicing compounds always will be held worthy of your confidence and support.

WIRE DEPARTMENT
United States Rubber Products, Inc.
1790 Broadway New York, N. Y.

United States Rubber Company

EC

SEPTEMBER 1935

Welcome N.E.C.A.

THERE is no gainsaying the fact that an annual convention of a national association is a high light in the business life of the people from which that organization draws its membership. Though the membership may represent only a fraction of the total number of possible members, and though only a fraction of the membership attends the meeting, the convention represents another year of achievement for its industry, and the beginning of a new year of effort.

THE publishers of ELECTRICAL CONTRACTING, therefore, are happy to greet the National Electrical Contractors Association upon its return to the practice of holding an annual convention. The meeting to be held this year at the Hotel LaSalle in Chicago, September 23, 24, and 25, is the first convention since that held at Kansas City in 1932.

IN the three years that have elapsed, however, the Association has been far from being inactive. It is true that it had to reduce its budget in line with falling membership and lower income, but nevertheless it never faltered in the maintenance of a national contact for electrical contractors with other associations and Washington.

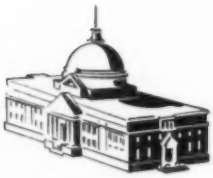
ITS most important contribution during that time was, of course, the drafting and sponsoring of a code of fair competition. It is doubtful if this Code, which, incidentally, was the best administered of all of the construction codes, could have had such wide acceptance and compliance, with nearly 10,000 contractors paying assessments, had it not been for the organizing ability of those who direct the affairs of the N. E. C. A.

AND now that the Codes are through, we find the Association ready with a new program—a program of constructive rebuilding of the contracting business. This program is stimulating because, if successful, as it must be, it will help to raise the electrical contracting business from a level of competitive selling to that of creative selling. It will make more contractors dependent upon their own creative efforts, rather than upon the ups and downs of the building construction market.

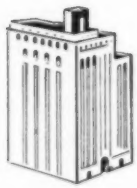
THE proof that this is no mere pipe dream, but is a fact accomplished with many concerns, will be found in this, the 1935 Convention Issue of ELECTRICAL CONTRACTING.

UMI

Jobs are there for alert electrical contractors



PUBLIC BUILDINGS



HOUSING PROJECT



SCHOOLS



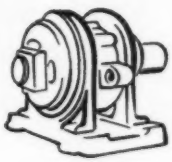
HOSPITALS

THE construction industry is coming back to life. For the first time in years, sizeable funds are being made available for construction projects large and small, public and private. These projects mean more and more jobs for electrical contractors if they go out after these jobs.

The contractor's opportunities will be varied in scope. It may be a simple remodelling job. Or it may be a large scale public building project.

Naturally, electrical equipment will be needed. Quickly and economically. The contractor must have a dependable source of supply, geared to his needs.

Graybar fulfills this need. It brings to electrical contractors an experienced service of supply equal to any requirement and including anything and everything electrical. It brings, too, a 66 year old reputation for dependable materials—a reputation that will back up the reliable contractor's own good reputation.



MOTORS



LIGHTING FIXTURES



SIGNALLING



WIRE AND CONDUIT

GraybaR
ELECTRIC COMPANY

OFFICES IN 77 PRINCIPAL CITIES. EXECUTIVE OFFICES, GRAYBAR BUILDING, NEW YORK, N. Y.

UMI

ELECTRICAL CONTRACTING

Vol. 34 SEPTEMBER, 1935 No. 11

▲

S. B. Williams, Editor

▼

FIELD BRIEFS

● ALTHOUGH REVERSED by the appellate court, the California Supreme Court upheld the original superior court decision awarding the widow of a plumber named Bellow $20,000 because her husband was electrocuted while working in a basement where his snake wire came in contact with a bare spot in an extension cord carrying 110 volts. Although the extension cord was installed by the tenant the fact that it was not run in accordance with the San Diego wiring code was held to make the owner of the property responsible for the acts of his tenants. This is considered an important case in upholding wiring ordinances.

● RANGE WIRING JOBS as installed in Pittsfield, Mass., are found by Beardsley and Martin to involve twenty to twenty-three separate items of material for standard one-family installations, and from twenty-eight to thirty items when occurring in multi-family structures. Therefore, Frank H. Beardsley has compiled a summary or check-list of these materials which is used for estimating and for sending materials to the jobs. This list also includes all the unit prices of such material items. It is claimed that no errors, oversights, under- or overcharges are likely to occur as a result of following this simple method.

● TWENTY THOUSAND visitors went through the General Electric's first "New American" home at Marblehead, Mass., the first day it was opened. This is probably a national record for any model home let alone an electric home. Over three hundred of these homes are now under construction throughout the country, all of which will be opened for public inspection on October 6.

● APPLIANCE SALES promotion and credit, of the Electric Home & Farm Authority, heretofore confined to the Tennesee Valley, will be extended throughout the country, in conjunction with the hundred million dollar rural electrification program. Its operations have been completely divorced from TVA. The list of appliances now available — refrigerators, ranges, water heaters and pumps —will be enlarged to include a greater variety of equipment for farm electrification. Sales will continue to be made through private dealers and the merchandising departments of public utilities. Installment periods will be stretched from four to seven years on expensive equipment. As at present, dealers' paper will be purchased by EHFA.

● WHAT IS BELIEVED to be the only building of its kind, erected solely for the purpose of studying natural lightning and equipped with a periscope and a specially-designed, 12-lens, motor-operated high speed camera, has been erected at the Pittsfield Works of the General Electric Company.

● BOOKINGS by electrical manufacturers in the second quarter made the best showing since 1931 according to a study of 78 reports by Standard Statistics, which predicts that 1935 will show a gain over 1934 bookings of approximately 15 per cent.

UMI

SELLING to be Dominant Note at N. E. C. A. Convention

1935 N. E. C. A. Convention Committee

JOHN F. GILCHRIST, Hon. Chairman,
Vice Pres. Commonwealth Edison Co.

General Executive Committee

WM. McGUINEAS, Chairman
President, United Electrical Construction Co.
C. K. CREGIER, Vice Chairman
Chief Electrical Inspector, Dept. of Gas & Electricity, Chicago, Ill.
M. R. ELY, Secretary-Treasurer
Electric Association
A. I. APPLETON,
President, Appleton Electric Co.
R. C. BENNETT,
President, I. A. Bennett Company
W. H. COLMAN,
Western Manager,
Building Equipment Sales,
General Electric Company
J. W. COLLINS,
Secretary, Electrical Contractors Association of Chicago
FRED R. EISEMAN,
Secretary-Treasurer, Revere Electric Company
WALTER HOAGLAND,
Central District Manager, Graybar Electric Company
W. H. HODGE,
Vice President, Byllesby Engineering & Management Corporation
FRED S. KINSEY,
Manager, Middle Western Division,
Westinghouse Lamp Company
JOHN G. LEARNED,
Vice President, Public Service Company of Northern Illinois
E. W. LLOYD,
Vice President, Commonwealth Edison Company
L. E. MAYER,
President, White City Electric Company
A. H. MEYER,
Manager, Midland Division,
Incandescent Lamp Dept., General Electric Co.
R. J. NICKLES,
Executive Committeeman
Great Lakes Div.,
National Electrical Contractors Association
FRED SKEEL,
Vice President, Crouse-Hinds Company
WILLIAM A. STACKEY,
Western Manager, Bryant Electric Co.
A. L. TREGENZA,
Vice President, Jefferson Electric Company

Finance Committee

KENNETH CURTIS, Chairman
President, Curtis Lighting, Inc.
W. O. BATCHELDER,
Commercial Vice President, General Electric Co.
W. J. DOHERTY
Doherty-Hafner Company
CHARLES DUBSKY,
District Sales Manager
Crouse-Hinds Co.
A. L. EUSTICE,
President, Economy Fuse & Mfg. Co.
ARNOLD H. FRIEND,
Sales Manager, M. B. Austin Co.
A. P. GOOD,
Manager, Meter Dept., Commonwealth Edison Co.
C. B. HARLOW,
Sales Manager, Central Division,
Benjamin Electric Mfg. Co.
G. A. HUGHES,
President, Edison General Electric Appliance Co.
E. W. KEARNS,
Central District Manager, General Cable Corp.
W. E. McCULLOUGH,
President, East Electric Company, Gary, Ind.
CHARLES M. PAULSEN,
President, Local 134, I. B. of E. W.
FRED T. WHITING,
N. W. District Manager,
Westinghouse Electric & Manufacturing Co.

First Convention in Three Years Will Discuss Numerous Plans for Increasing Contractor's Business

THE first convention of the National Electrical Contractors Association since 1932 will be held in Chicago at the Hotel La Salle, September 23, 24 and 25 with six business sessions, the dominant theme for which will be ways and means for increasing the electrical contractor's business.

The program on the opposite page covers a wide variety of subjects each to be presented by a speaker who has devoted a considerable time to the study of the subject from the practical view-point. Each speaker will be given a definite amount of time for the presentation of his paper after which discussion will be invited in order to secure the maximum amount of field experience.

A new form of constitution and by-laws, which has received the approval of the Executive Committee, will be presented to the convention for its ratification. Should this proposed constitution be adopted, the election of officers and executive committeemen, ordinarily held at the convention, will take place immediately after the convention by mail ballot.

There will be no closed session but all of the six will be open to everyone attending the convention, including the ladies.

Besides the business sessions there will be a banquet on Tuesday evening, followed by entertainment and dancing. In addition, the entertainment committee is providing for a style show for the ladies on Monday afternoon; a card party for everybody, Monday evening; luncheon and entertainment for the ladies, Tuesday noon; and a card party for the ladies, Wednesday afternoon.

The Executive Committee will hold meetings on Saturday and Sunday before the convention to complete the details of its recommendation to the delegates.

33rd ANNUAL CONVENTION PROGRAM

Hotel LaSalle, Chicago, Illinois **September 23, 24, 25**

MONDAY, SEPTEMBER 23

Opening of Convention.

Roll Call.

Appointment of Resolutions Committee.

Introduction of Chicago Convention Committee.

Introduction of Mayor *by President Mayer.*

Mayor's Address: *Hon. Edward J. Kelly, Mayor of the City of Chicago.*

Response to Mayor: *J. A. Fowler, Executive Committeeman, Memphis, Tenn.*

President's Address: *L. E. Mayer, President, N.E.C.A.*

Secretary and Treasurer's Report: *L. W. Davis, General Manager, N.E.C.A.*

"Voluntary Agreements for Industry Self Regulation": *W. W. Ingalls, Executive Committeeman, Miami, Fla.*

"Declaration of Policy on Wiring": *E. N. Peak, Vice President, N.E.C.A., Marshalltown, Ia.*

"The Buyer and the Seller": *William McGuineas, President, Electrical Contractors Association of Chicago, Ill.*

"Electric Range Merchandising and Wiring": *F. T. Langford, Executive Committeeman, Minneapolis, Minn.*

"Merchandising and Time Payments": *Louis Kalischer, Executive Committeeman, Brooklyn, N. Y.*

New Constitution and By-Laws. Action upon Recommendations of Executive Committee.

Report on Association Financing: *E. N. Peak, Chairman, Special Committee.*

TUESDAY, SEPTEMBER 24

"New Business Development": *G. M. Sanborn, Executive Committeeman, Indianapolis, Ind.*

"Selling Industrials": *W. W. Clark, Executive Committeeman, Cleveland, Ohio.*

"Adequate Differentials between Contractors and Consumers": *R. M. Walker, Atlanta, Ga.*

Open Forum Discussion by Members.

"Safeguarding Electric Service in the Home": *J. A. Smith, Public Relations Committee, Eastern Section.*

"The Future of our Industry": *D. W. Tracy, International President, International Brotherhood of Electrical Workers.*

"Better Light—Better Sight": *Dr. Geo. W. Allison, National Better Light—Better Sight Bureau.*

Motor Specialists Session: *J. R. Stolzenbach, Chairman, National Motor Section, Baltimore, Md.*

"Effect of Manufacturers' New Motor Sales Policies on Dealer's Pocketbook": *F. O. Sievers, San Francisco, Cal.*

"Recommended Motor Distribution Policies": *H. B. Frazer, Philadelphia, Pa.*

WEDNESDAY, SEPTEMBER 25

"Legislation for Separation of Contracts": *John W. Hooley, Chairman of Joint Committee.*

"A Stimulant to Business—The National Housing Act": *A. O. Eberhart, Former Governor of Minnesota, representing the Federal Housing Administration.*

"State Electrical Legislation": *Arthur L. Abbott, Uniform Legislation Department, National Electrical Manufacturers Association.*

"The Architect and the Electrical Contractor": *Representative of American Institute of Architects.*

"New Light Sources and their Application": *J. L. McCoy, Commercial Engineering Department, Westinghouse Lamp Company, Bloomfield, N. J.*

"The Story of Safecote Electrical Conductors": *A. Penn Denton, Field Engineer, Safecote Rubber Covered Wire Manufacturers.*

"Development of Adequate Wiring Standards": *E. A. Brand, Chairman, Joint Industry Committee for Preparation of Manual of Wiring Design.*

"Wiring for the 'New American' Home": *Homer G. Knoederer, Engineer, Construction Materials, General Electric Company, Bridgeport, Conn.*

"Changes in 1935 Code": *Victor H. Tousley, Secretary, I.A.E.I.; Secretary, Electrical Committee, N.F.P.A.*

How the electrical industry can take advantage of

Fire Prevention Week

A PROGRAM to make the public conscious of the hazards of poor and neglected wiring will be undertaken by the International Asociation of Electrical Inspectors during Fire Prevention Week, October 6-12. Articles written around cord wiring and the need for approved installations by competent wiremen have been prepared for many general magazines and newspapers. In addition, a number of the home magazines will carry advertisements offering booklets on safe wiring.

Because of the publicity that always accompanies Fire Prevention Week and the extra publicity this year on electrical fire hazards, there is an opportunity for the local electrical industry to create a very definite public desire for better wiring.

Following are some suggestions of ways in which the industry can take advantage of the opportunity offered by Fire Prevention Week.

1—Publicity—

a) Interviews in local papers with electrical inspectors, prominent contractors and utility men on the hazards of handy-man wiring and the need for reinspection.

b) Talks before church, school, fraternal and social groups during the week.

c) A short message over the local radio station during some spare time.

d) Show window displays by all contractors and utilities showing approved and unapproved wiring and materials with proper placards.

2—Reinspection—

a) Furnish the fire department with simple inspection blanks to be used in their annual inspection.

b) Furnish school children with home inspection blanks.

c) Use all inspectors during the week on reinspections.

d) Furnish newspapers with pictures of defective wiring.

e) Have inspection department and contractors announce through the newspapers free inspections during the week.

3—Cooperation—

a) An all industry-meeting on electrical hazards so as to get everybody thinking alike.

b) Joint industry displays in vacant stores or utility auditoriums. A standard display is now available.

UMI

The Inspector Expects Support

A straight-from-the-shoulder statement of the electrical contractor's shortcomings and what he can do to retain the inspector's cooperation

By George Welman
Electrical Engineer
Louisiana Rating and Fire Prevention Bureau

THE average contractor is no different from the usual run of us human beings. When matters run along smoothly we are inclined to take life easy and when there is rough sledding fight like heck and growl about almost everything. It is not strange, therefore, that contractors should expect inspectors to make reinspections during dull times, but the inspectors in turn expect the contractors to support them by taking an active interest in inspectors' problems.

Reinspection is a permanent program with every electrical inspection department worthy of the name. Whole sections of cities and entire business districts in towns are continually being inspected.

The electrical inspection department feels that it is necessary to keep a check on old installations, first, to remove the hazard from dangerous electrical work; second, as a police regulation to teach the user of electrical current that his installation must not be altered without the consent of the authorities and, third, to keep a check on the quality of materials that may be bootlegged into a locality.

The electrical reinspection program has its counterpart in the sanitary and rubbish inspection services of a city. It is a necessary work for the good of all concerned and naturally we expect to see some reciprocity practiced by the various commercial units in the electrical field.

Every time the contractor prominently calls his customer's attention to the inspection fee; every time he tells the customer that the inspector is "all wet" and has condemned work that is in good shape, and that he can fix up the job for only a fraction of what the inspector wants done; every time the contractor tells his customer "as a friend" to get some of the higher ups politically to tell the inspector to keep off and he will make a few repairs which will serve the purpose; every time the contractor does any of these things he helps to break down the good will of the inspector.

Inspector Needs Assistance

The contractors instead should have a real constructive program in this respect and become closer associated with the inspectors as a body. When the contractor realizes that his right to exist as an electrical contractor depends entirely on his own initiative and ability, he will at the same moment discover that the inspector needs his assistance, even more so than the contractor needs the inspector's.

We expect the contractors to use some energy with the officials of a city in our behalf. If the contractors will deal with our association collectively in order to secure a uniform and impartial inspection service they will in the long run do more towards establishing their business than through commercial agreements solely among themselves.

We have our problems and the most important one at present is to take the inspection department out of politics. A solid backing of the contractors and their friends can do this, if they will, and we firmly believe that it is through a lack of interest by the contractors that the average inspector is today a buffer in partisan political battles.

Contractors complain about the cost of inspections but what have they done to demand that the money collected for inspection fees be used solely for the purpose of maintaining the inspection service? Inspection fees placed in a general fund naturally leave no surplus to cover the cost of reinspection. As far as the inspection department of a city is concerned the contractors must forget their partisan political affiliations in dealing with the inspection deparment and in turn demand an inspection department that will not permit partisan politics to interfere in its operation. All of these constructive movements could rapidly be accomplished if the contractors would recognize the inspectors' association and by their presence and counsel at our meetings encourage the inspectors to look the world squarely in the face and not be timid. Contractors should demand that inspection departments be operated efficiently and that decent consideration by the inspection department is all that good business demands.

Upbuilding

The contractors through their organization have failed to even scratch the surface in contacting all contractors, but the inspectors know where every one of the good and poor contractors are located and are trying through their educational program to make all contractors good contractors. This, of course, is contrary to the usual procedure of trying to eliminate the poor contractor by force, which has been the way ever since the first contractors established themselves. Force has not succeeded to this day in reducing the number of contractors who install a poor grade of electrical construction. It is the inspectors, who condemn the poor workmanship and recommend that capable electricians be employed to correct the defects, who are gradually educating the people in safe electrical construction, and thereby discouraging those not qualified to engage in electrical construction.

The only way that we will ever get rid of dangerous electrical work is to continually reinspect existing electrical installations so that the users of current will realize that it does not pay to employ incompetent electricians.

The inspector is not a galley slave and if contractors want to induce inspectors to make reinspections, the contractors should be willing to meet with the inspectors on an equal footing and reciprocate by taking an active part in solving inspectors' problems, as well as their own. As a matter of fact, the problems are identical.

UMI

Silk Mill Modernization Brings 14 ft. Candles and Improved Production

Complete rewiring more economical than patching old wiring

A MODERNIZATION operation which converted an obsolete lighting system and a maze of group drive overhead belting to efficient factory standards was recently completed by Ralph J. Walter, industrial contractor and consultant of Bethlehem, Pa.

The local silk throwing plant of the Modern Throwing Company, a division of the Concordia-Gallia Corporation, had become a maintenance problem to its owners. It was difficult to provide good lighting facilities because of the many overhead belts and the inadequate wiring system which had been originally provided. Operations that involved the twisting of fine silk and rayon into minute threads imposed fatiguing visual tasks that necessitated modern industrial lighting. The old group motor drives, in addition to the belting nuisance, also subjected this plant to occasional shutdowns which involved batteries of spinning machines. These are now individually motored, thus permitting greater freedom in sectional operations. An average illumination intensity of 14 ft. candles is now provided in the various sections of the plant.

The completed installation is almost entirely a new wiring system. New service facilities of adequate capacity were provided for about 140 motors and the various lighting circuits. From the main service equipment a new feeder system was planned to supply new panelboards.

Practical industrial experience dictated to the contractor the advantages of disregarding old wiring and the greater value of a new layout. By removing old runs that served the original motors and lights it was possible to install a neat job at minimum cost. The time which would have been consumed in patching on to portions of an old system was considered as costly as complete rewiring. Moreover, the present installation gives this plant a complete system made up of new materials that will render service for a long period before maintenance problems are likely to arise.

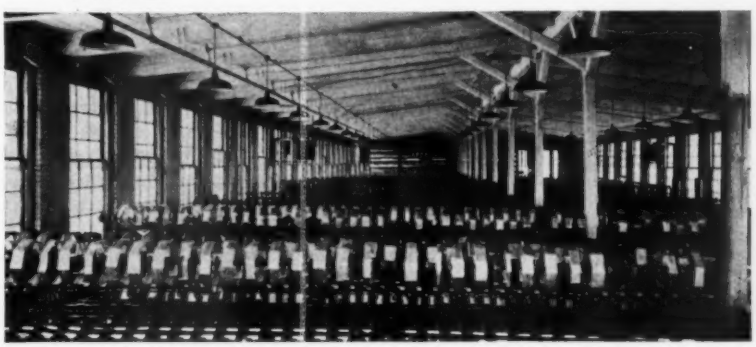
This example of contractor modernization work in industrial plants reflects the efforts of experience and courageous salesmanship. Mr. Walters, who engineered and sold this job is of the opinion that there are similar opportunities to be found elsewhere. They depend to a great extent upon a reputation for good engineering and the contractor's ability to present sound reasons that will justify an owner's expenditure of money for such improvements.



An example of economical motor wiring run from the ceiling below to a 1½ h.p. double deck spinner. Thermal overload safety starting switches have been placed out of the way, yet readily accessible. Short flexible steel conduit connections from the switch to the motor were thus possible. Belt tension adjustments require only slight motor shifting, therefore the wiring connections do not need to provide an unsightly amount of slack.

A group of double-deck spinners, each with an individual vertical-shafted motor at the floor and a magnetic starter above. New power panels were placed on columns in line with horizontal branch circuit conduits that were run to junction boxes above the starters.

The spinning frames on the second floor are provided with outlets at 9 ft. centers lengthwise. Night shifts enjoy favorable lighting conditions in handling skeins of delicate silk and rayon that is here subjected to its first spinning operation, while daylight workers receive diffused light from a ceiling which is not cluttered up to gather lint.





UMI

35 Lumens Per Watt

New high intensity mercury vapor lamp represents forward step in efficiency of light production

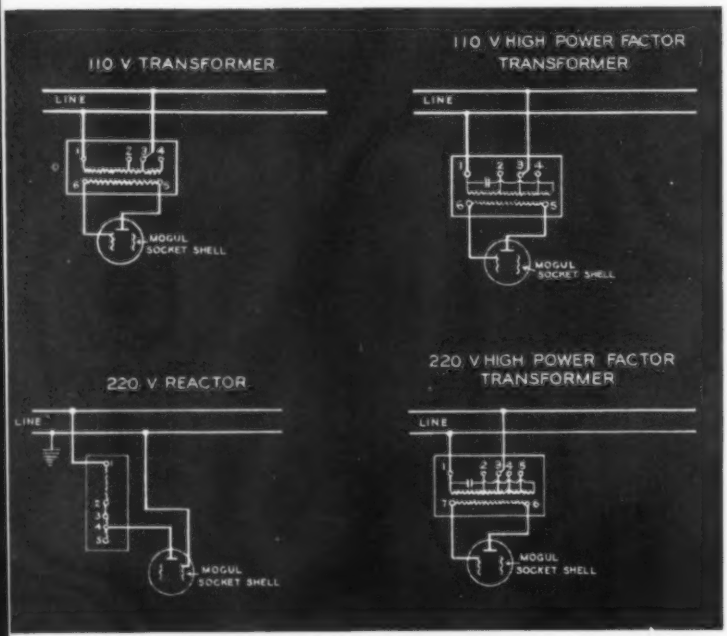
By Dean M. Warren

General Electric Company
Nela Park Engineering Department
Cleveland, Ohio



This system of high intensity mercury vapor lamps and incandescent lamps produces 20 ft.-candles of illumination on the working plane. Each bay has two rows of incandescent lamps and one of mercury vapor. Auxiliary equipment is mounted directly above each of the mercury vapor lamps.

Wiring diagrams showing connections of auxiliary equipment



SINCE the beginning of time man has endeavored to produce artificial light so as to utilize more thoroughly the hours of darkness for the purpose of work or pleasure.

In the beginning, these sources of artificial light were quite feeble when compared with present day illuminants. However, beginning with Thomas Edison's lamp, with its efficiency of a little more than one lumen per watt, and continuing to the present, we find that lamp efficiencies have increased about twenty fold.

Man's contest against darkness has not confined itself to the development of incandescent lamps alone. Experiment on gaseous conductor lamps has pretty much paralleled the development in filament lamps. Operating characteristics have been steadily improved and today as a result of the never ending search for better light sources, the new high intensity mercury vapor lamp, with an output of approximately 35 lumens per watt, has been developed.

APPEARANCE—The new high intensity mercury vapor lamp, twice as efficient as former vapor sources and incandescent lamps of comparable wattage, is tubular in shape, has an overall length of 13 in., consumes 400 watts, and is equipped with a mogul screw base. Being equipped with this type of base, it can be used in equipments already on the market but when so used auxiliary equipment is required for individual lamps.

OPERATION—A 7½-in. glass tube is housed inside a tubular glass envelope, which contains a small and very carefully measured amount of mercury, and a low pressure of argon for starting. An electrode is sealed at each end. To simplify starting the lamp, a third electrode is placed near one of the main electrodes and connected to the other, thereby enabling the lamp to be started at a much lower voltage than would be required if the arc had to strike the full distance between the main electrodes.

For starting at normal temperatures the lamp requires a breakdown voltage of 130-160 volts. Almost instantaneously with the striking of the arc, however, the voltage falls to about 20 volts at 5 amp., from which

UMI

point it builds up gradually to its normal operating voltage of approximately 155 volts at 2.8 amp.

Where normal operation is interrupted, it is necessary for the lamp to cool to reduce the vapor pressure to a point where the available voltage will restart the arc. Generally it requires about 15 minutes for the vapor pressure to become sufficiently reduced for the lamp to restart itself automatically.

AUXILIARY EQUIPMENT—Accurately designed reactive equipment is necessary to take up the difference between the impressed voltage and the varying voltage of the lamp, maintaining the current within proper limits. When operated on 230-volt circuits, the series reactance is all that is required. For 115-volt circuits it is necessary to step up the impressed voltage, for which purpose either a reactive transformer or a combination of a reactance and transformer is used.

On 115-volt circuits where power factor is of first importance, a transformer with a built-in condenser will insure about a 92 per cent power factor. A 60 to 65 per cent power factor obtains where a condenser is not used with the lamp.

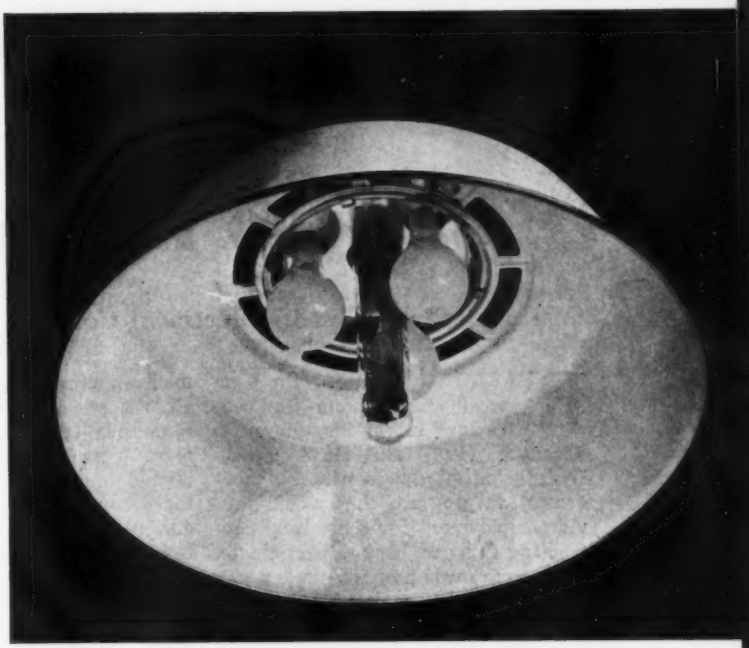
On 230-volt circuits the simplest auxiliary is an iron-core reactor connected in series with the lamp, which likewise gives a resultant power factor of 60 to 65 per cent. Where it is desired to correct the power factor, a transformer-condenser combination or a reactor-condenser combination will give a resultant power factor of 90 to 95 per cent.

LOCATION AND METHODS OF INSTALLATION—The auxiliary equipment may be located either at the lamp or at a distance from it, so long as no other current is drawn from the circuit between the equipment and the lamp. This permits the regulators for a number of lamps to be grouped together. One plant in which this practice was followed for about 1000 lamps, built frame works on which 110-volt auxiliaries of high power factor type were grouped. By properly numbering the switches and lamps, the maintenance men and section foremen have no trouble in lighting or serving individual units. If anything should go wrong with the auxiliary equipment, they are in such a position that they can be readily checked and repairs or substitutions made.

APPLICATION—Because the major portion of the 14,000 lumens of light produced by this new lamp is in the yellow-green band of the spectrum, it combines well with the continuous spectrum Mazda lamp to produce a very good synthetic white light. Although this light is not of sufficient purity to be used for "color matching," it mixes well enough with natural daylight to provide pleasant lighting for the factory, the office, the school, or any place, in fact, where accurate color discrimination is not required.

The mercury vapor lamp and the Mazda lamp may be combined in the same unit or used in separate units. Mixed lumen for lumen, a light can be produced that has the visual appearance of daylight.

With people becoming more and more light conscious, and with the electrical industry bending every effort to help reduce the mounting toll of crippled eyes, the new high intensity mercury vapor lamp, with its high efficiency, becomes a really valuable tool to those engaged in the lighting profession.



An industrial unit showing the arrangement of incandescent and mercury vapor lamps.

An office equipped with combination units, each of which employs one mercury vapor lamp and four 200-watt Mazda lamps. An initial level of 63 ft.-candles is obtained from this system.



UMI

Outdoor Meter Plan Creates $85,000 Business

for Scranton Electrical Contractors

REALIZING the need for electrical work among the contractors in its territory, the Scranton (Pa.) Electric Company recently initiated a cooperative modernization program that would provide employment for those local contracting firms wishing to participate. This program is now well under way and is expected to involve upwards of $85,000 annually in wiring jobs for contractors in the areas served by this utility company. All of this appropriation is for making improvements in this company's service and metering facilities.

Because of giving this work out to contractors, instead of its being handled by the company's construction employees, a plan of job allocation was adopted that prevents the possibility of complaints of favoritism arising among rival firms. Outdoor meter installations that replace old attic or basement meters are solicited by the contractor direct, and are not "handed out" by the power company. Larger capacity service modernizations, such as d.c. to a.c. changeovers, and overhead to underground network installations in the commercial districts are awarded by competitive bidding. Bids for this latter work are secured by the company after definite details and specifications have been prepared by its engineering staff.

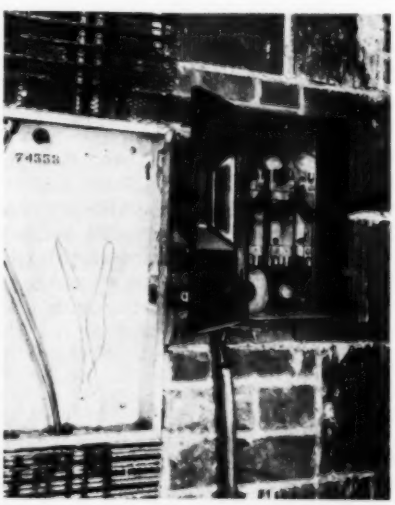
When a contractor has visited a home owner and has arranged for the service to be modernized, that contractor has created a job for himself. He needs but to advise the power company that customer consent has been obtained, and he is promptly authorized to proceed with the work. Upon completion of the change and after obtaining a suitable clearance from the owner and the power company inspector, this work is paid for by the company.

Certain important phases of customer relations are back of this novel modernization procedure. First of all, the power company is enlisting numerous contractors as its salesmen. This sales effort is largely conducted among people with whom these contractors are personally acquainted. This service modernization work, furthermore, provides the contractor an opportunity to seek other work on the premises. Those customers who may not feel inclined toward having an outdoor meter, are enlightened by the contractor as to the advantages to be derived from eliminating the old nuisance of admitting meter readers to the home. Then there is a further appeal from a work-creative standpoint, since customer consent results in a wiring job for the contractor. This has a good will value for the power company in the eyes of many home owners, since many of them are in sympathy with any measure that tends to provide gainful employment especially for contractors known to them.

This plan is economical for the power company because the employment of electrical contractors for securing customer consent to service modernizations tends to limit its own field staff. Although this work cannot be expected to last indefinitely in a locality of this size, the creation of an $85,000 per year wiring market during these slack times has considerable value to these contractors who are otherwise faced with very little work.

Concealed Duct Connects Surface Switch to Flush Panelboard

In wiring a gasoline station at Wilkes-Barre, Pa., Frank Baldwin, local contractor, installed a flush panelboard cabinet beside a 100 amp. surface type service switch. A curved 2-in. by 2-in. metal raceway was welded into the cabinet sidewall, and its opposite end was welded to the back of the service switch, thus providing a concealed metal raceway between these two units which was effectively bonded because of the welded connections. The upper ends of the switch and cabinet were braced by means of a ⅜-in. by 1½-in. flat iron bracket that was also welded to both units. This rigid assembly was made up in the shop and installed in place before the partition was built. After the wall has been plastered, a meter board will be installed above the service switch, and the No. 4 lead-sheathed service conductors will be encased in a conduit nipple between an elbow which is now in the concrete floor, and the service switch. This pre-fabricated supporting method permitted a neat conversion from surface wiring to concealed wiring in cramped quarters.



An exposed underground service was brought into this 100 amp. surface-mounted meter service switch. The metered conductors were then carried to the adjoining flush panelboard by means of a concealed metal raceway elbow which had been welded to the back of the metal switch case and the side of panelboard cabinet before their erection.

Switchboard Installation Costs

By Ray Ashley

THE outstanding feature of a switchboard, being the number of panels, creates a tendency to set up labor units based on panel sections. Out of some fifty estimators interviewed, approximately 80 per cent had units of this kind. Some of them had fixed units which could not possibly produce figures of value for close computation. Others had basic units to which they made additions or deductions, thus compensating for variations. Both service and switch panel units were adjusted according to the ampere capacity, and allowances were made to cover the extra copper required for the panels farthest removed from the service. Special equipment, such as meters and current transformers, also had separate units. With units built up in such a manner, reliable estimators are able to figure all types of boards and get consistent results.

Try as one may, it is impossible to build up reliable units without taking into consideration certain details and, in spite of all the arguments to the contrary, the writer maintains that it is just as simple to figure with units, covering these details, as it is to use a unit which covers a group of operations, but have to be modified to cover varying conditions.

Accuracy of switchboard labor estimates depends upon fixed divisional costs which reflect the variations encountered. Handling, erection and assembly are all likely to vary.

The greatest difficulty in connection with the detailed units is encountered in accumulating the cost data. The units used in the accompanying estimate were built up over a period of years, from data kept in the installation of boards which varied in types and sizes. In keeping this data, installation of the following equipment was carefully studied:

(1) Base channel
(2) Frame
(3) Panels
(4) Main bus copper
(5) Branch copper (from switchboard to bus and terminals)

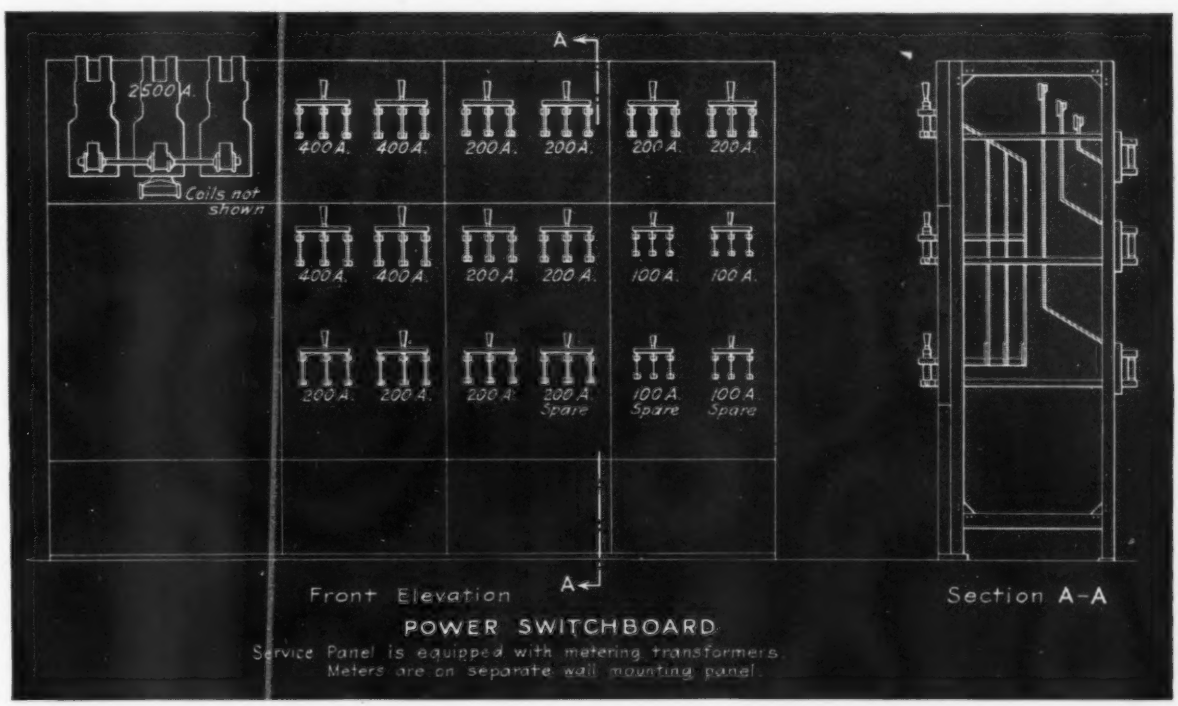
Setting Base Channel

There is a tendency to underrate the importance of the base channel. Only good foremen with extensive experience on switchboards are able to appreciate the necessity of having this part of the installation performed with precision.

Shimming up panels on a poor base is a slow and expensive operation. Hours are sometimes spent trying to get the panels to fit properly, and after the work is completed it lacks some of the earmarks of a first class installation.

One may look at a unit of 5½ hours for setting an 11-ft. base rail and say "ridiculous." It is not a case of two men carrying in an 11-ft. piece of steel and leveling it on a finished floor. When one is sitting in an office looking at a set of plans, it is hard to visualize the actual conditions which will exist at the time the channel is to be installed.

The specifications may make it imperative that the base be installed



UMI

LABOR COST UNITS IN MAN HOURS FOR A THREE PANEL SWITCHBOARD

Item		Quantity	Receive and Move In		Erecting	
			Unit	Extension	Unit	Extension
6-in. Channel-base	Ft.	11	.03	0.33	.5	5.50
Frame (2½ x ¼-in. angle)	Lb.	640	.008	5.12	.042	26.88
2500 A. 3-pole, breaker		1	7.5	7.50	11.0	11.00
30-in.x72-in.—2 sect. panels		3	1.5	4.50	2.6	7.80
18-in. Sub base	Sections	4	.4	1.60	0.8	3.20
Fuse panels (Rear of board)		3	.3	0.90	0.7	2.10
Current transformers		2	.5	1.00	4.5	9.00
Main bus copper	Lb.	300	.01	3.00	.04	12.00
Branch bus copper						
For 400 A. switches		6	.30	1.80	1.7	10.20
For 200 A. Switches		10	.25	2.50	1.50	15.00
For 100 A. Switches		4	.25	1.00	1.50	6.00
Connecting cable						
800 A. Lugs (Ct. Br.)		9	.....	....	3.0	27.00
400 A. Lugs (Sw.)		6	.....	....	1.75	10.50
300 A. Lugs (Sw.)		6	.....	....	1.50	9.00
200 A. Lugs (Sw.)		24	.....	....	1.10	26.40
100 A. Lugs (Sw.)		6	.....	....	.8	4.80
Meter wiring (On board only) (Meter and meter ftg. are on wall mtg. panel.)		1	.....	....	5.0	5.00
Totals				29.25		191.38

when the main floor slab is poured. It then becomes a case of taking a transit to establish lines and elevation. Considerable time is spent checking measurements to make sure the board will line up with the finished walls.

The practice of setting a wood form when the floor is poured, and coming along later with the base is very good. The dimensions of the form must be liberal enough to allow considerable latitude for shifting the base, and for installing the grout after the setting is completed.

In order to set a frame on an old concrete floor, it is, of course, necessary to break up the concrete. The installation then becomes about the same as one where a form has been set.

Erecting Frame

With the base channel properly set, erecting the frame is comparatively simple. Simple as it may become, it is not an operation that can be hurried through "pell-mell." If the panels are going to fit properly, every part of the frame must line up. Careful checking is required throughout the erection, for after the panels are up is a poor time to find out that the frame does not set properly.

Panels and Breakers

The cost of erecting large circuit breakers depends a great deal on the equipment and facilities for supporting chain falls. It is always poor economy to keep the number of men for such work too low.

With a framework properly erected, installation of the switch panels should not be difficult. Variation in the costs for receiving will be discussed later in this article.

Installing Copper

The main bus copper varies with the capacity of the service and the length and design of the board. The only logical unit to take care of these variations is one based on the weight of copper.

The variation that is found in the weight of copper required for a switch of a given size is too small to affect the labor. The principal labor for installing the connections from the main bus to the switch and from the switch to the cable terminals is used in sorting out the proper pieces and making the bolted connections.

Connecting Cables

The cost of soldering on lugs and making cable connections on a switchboard does not vary greatly from the cost of similar work on an enclosed panel. The advantage gained by the large number in a group is offset by the necessity of keeping the cable in better order. By figuring the individual connections, the estimate reflects any saving due to spare switches on the panels. On boards which are designed for future feeders, this may be a material item.

Division of Labor

It will be noted that the labor for receiving the equipment and moving it in is separated from the labor for erecting. The purpose being to segregate the variable from the fixed portion.

The cost of receiving the board and moving it in varies according to the location of the switchboard room and the facilities for doing work. The units used herein are based on delivery to a basement room with elevator service. If the switchboard room should be on the first floor near a delivery entrance, then units could be reduced from 10 to 15 per cent. Contrasted to this is the case of a board being delivered to a sub-basement, with no elevator service available. In such a case the cost of rigging up chain falls, and moving equipment across the basements may increase the receiving costs 25 to 50 per cent. Another costly situation is that of a switchboard room located on one of the upper floors. Even if elevator service is available other trades use the same elevator and each has to await its turn. The material can only be hauled in small quantities and is handled several times.

The cost of erecting should not vary a great deal. One room may be more cramped than another, or a little more time may be lost moving tools, but in general the variation is slight. This is, of course, assuming that the switchboard has been properly constructed.

Assembly Problems

Switchboards may be built according to the same plans and specifications and still show a great variation in cost of labor for erection. The apparatus from some shops can be put together without difficulty, while that from others may cause a great loss of time. This difference may be as great as 10 per cent on new equipment and from 15 to 20 per cent for alteration work. On alteration work, a whole switchboard crew may be held up because the manufactured equipment did not fit in properly with the old board.

From the time a switchboard is submitted for figures until it is in operation, it requires the attention of an experienced man—a man who knows switchboards, knows switchboard manufacturers, and knows how to select and manage good workmen.

THE electrical contractor has two ways of getting business: He can wait for someone to ask him to bid *(the old way)* or he can go out and create some business for himself *(the new way)*.

For the man of initiative, who has the desire to increase his business profitably and who is willing to work, the new way—creative selling—is, of course, the open door to opportunity.

In the following pages there are some practical selling ideas for electrical contractors. Most of them are in actual operation and producing business. They show beyond a question of a doubt (1) what the electrical contractors can and do sell, and (2) that profitable work can be created in these times by selling.

In every article, it will be noted, one important thing stands out, and that is the approach. The contractors who have learned how to create work have found the answer to lie in "customer interest."

What does the customer need, why does he need it, what will it do for him?

The problem in creative selling, therefore, is first to find out what the customer needs. The second step is to convince him that you can fill that need. The matter of what materials you are going to use or how much the work will cost is of little importance until the customer agrees to have the work done.

16 Sales Suggestions

UMI

1 . . . . Sells Guaranteed Savings



S. W. Drucker

CREATING large commercial modernization jobs on the profit-sharing payment plan is the bold manner by which the Independent Wiring Company of Philadelphia, Pa., expects to do its best volume since 1928. With more than 50 per cent of the 1928 volume billed during the first half year, and several recent large contracts under way, S. W. Drucker is predicting that his company will pass the mark.

This company's clients are mainly composed of the leading banks, trust companies and others who own, operate or manage commercial and apartment properties. Investigations are made by this contracting organization to ferret out properties that are not being operated efficiently, and then to submit correction programs. This company's field data is so carefully prepared, and its engineers' estimates so accurate that contracts are made up which provide that the modernization work be paid for in installments out of the customer's monthly savings. These installments require from one year up to three years' time before they become completely liquidated, although this contracting organization has often invested sizable sums for equipment and labor in making such installations.

A recent contract of this type, amounting to $20,000 involves the removal of a steam heating and generating plant in an office building. It was found to be more economical to purchase heat and electrical energy. Therefore, the contract includes complete dismantling of the old plant, steam piping modernization (by sub-contract), d.c. to a.c. change-over of all motors, motorization of steam driven pumps, a primary transformer station, and the necessary feeder changes.

Some case studies of earlier self-liquidating contracts of record indicate how conservative engineering has brought in good business for this company. Case No. 1, a ten-story building was served and metered separately from a large restaurant tenant. A saving of $1,200 per year was estimated if these loads were combined. A primary installation was finally sold, however, at an anticipated annual saving of $3,000 for an investment of $2,900. The first year saving was actually $3,600, due to increased occupancy of the building. Case No. 2, a large building was offered a $7,000 primary installation as a paying investment. The contract was finally secured on a basis of accepting energy savings over a two-year period as installment payments. This plan paid the company considerably more than the original bid plus interest charges on all deferred payments.

All contracts that are based upon savings installments contain a provision by which the ownership of all installed equipment remains vested in the Independent Wiring Company for a stipulated term. A further provision requires the release of this claim in the event excessive savings should speed up the period or interim of liquidation.

Not all these jobs so created are finally awarded to this company, as occasionally the competitive price factor creeps in. Therefore, the volume of new business for which this company is responsible actually amounts to considerably more than its own contracts. Some of the projects are so attractive to the owners that they decide to invest their own money. In such cases the work is put on the auction block.

An interesting example of this company's sales methods may be deduced from Mr. Drucker's statement that every contract secured during the past two years included all of the materials and equipment required for the job. These jobs involved complete transformer stations, motors, control apparatus and general wiring materials.

Since this company was organized in 1919, its field has gradually been developed toward building maintenance and modernization. Having enjoyed the patronage of many trust companies, insurance companies and banks, as well as management organizations at the beginning of the depression, its services have been furnished without interruption to numerous properties under a succession of control. This company lays claim to being the only electrical firm to carry an advertisement in the local real estate board directory. No jobs are estimated unless this company has direct contact with the owners, or a reliable agent.

2 . . . . Sells Through His Service Contacts

IN a city of fifteen or twenty thousand people, the securing of wiring contracts is better accomplished through the innumerable personal contacts made in the service department than by spending time personally soliciting wiring jobs in times when at best they are relatively few. This is the opinion of H. H. Burgy of the Burgy Electric Works of Vancouver, Wash.

As a result of this policy, Burgy will be found doing the bulk of repair work on small appliances and motors himself. Many will say, "Why putter with such work when a boy can do it? Why spend valuable executive time that way?" Burgy's answer is that he cannot afford to turn over one of the most valuable business building parts of the work to any other than himself.

He has arranged the service department in the back of the store,

but in full view of the public through two doors. He works at a bench directly in front of one of these doors in full view. Whenever a customer comes in with a repair job he meets that customer at the counter and makes the contact himself. He does not take the appliance, name a price and tell the customer when to return for it. If possible he takes it apart in the presence of the customer. He explains how the trouble originated, and how he proposes to remedy it in the most satisfactory and lasting manner possible.

One typical example serves to illustrate his methods. A woman brought in the brushes to a washing machine motor, with cord attached. Both needed renewing and with an ordinary disinterested person in charge it would have been a 50 cent sale. But Burgy showed the woman that the wearing of the brushes indicated very clearly a rough commutator which needed turning down. She asked him to come to the house and inspect it, which he did, and was back very shortly with the motor

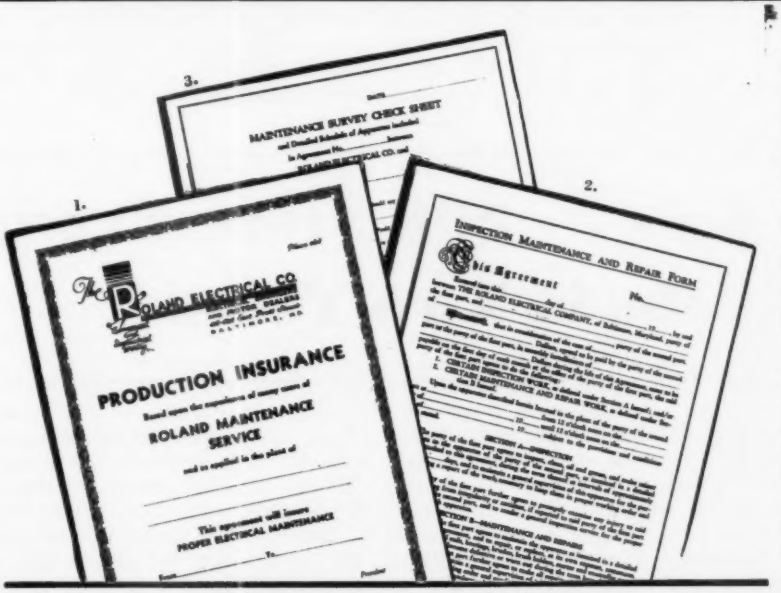


The appliance and motor repair department in Burgy's store is open to the public gaze. Burgy himself works at the entrance and meets the customer who has "trouble" right at the counter. Read how he turns this personal contact into wiring sales.

itself, which not only had commutator trouble but required complete overhaul. She was glad to have this done and the motor made practically as good as new, a job amounting to some three or four dollars. But that is not the main point. He had made personal and satisfactory contact with a family where the husband worked part of the time in town and part of the time on a farm of his own, where they were soon to build a new home. He was told that they wished to have him figure with them on the wiring of this place.

Not all service contacts work out to such immediate results, but in the end they serve to place him in the minds of the people of the community as the contractor who knows his business. Just anybody working in the service department cannot accomplish this. The result is that Burgy has not lost money in the contracting end of his business at any time during the depression, but has consistently extracted some profit from it, largely through this personal contact.

3 . . . . Production Insurance Sells Plant Maintenance Service



1. The front cover of Roland's 8-page method of selling Production Insurance.

2. Inspection maintenance and repair form; a folded contract, similar to an insurance policy.

3. Maintenance survey check sheet.

BECAUSE a complete industrial service organization, even though of long standing, cannot afford to rest on its oars, so to speak, the Roland Electrical Company, Baltimore, Md., decided to tell its story to the plant executive in a new way. "Production Insurance" contracts are offered to the industrial organizations in this company's service area as guarantees of the Roland Maintenance Service.

These production insurance contracts bring the shop to the executive's desk. The problems of plant inefficiency are forcibly portrayed, and their solution is likewise suggested in terms of savings.

Supplementary forms which are in use permit a minimum file record to serve as the basis for conducting this important branch of the company's business.

The production insurance, while nothing more than the well-known

UMI

maintenance contract, is sold to the customer as a service that will keep the plant running. Other sales arguments are lower depreciation, experienced operators, no shut-down losses. The owner is told that savings will run from 20 per cent to 30 per cent or maybe 50 per cent annually.

Production insurance is defined by the Roland Electrical Company in its "policy" form of descriptive literature as:

"Production Insurance is letting us do the worrying for you about part of your business. It is protecting your investment in economical manufacturing facilities. It is helping to raise the morale of your organization and enabling them to do their jobs better. It is an improved method of maintaining your equipment to a point of maximum usefulness. It lowers production costs because it reduces needless shut-downs."

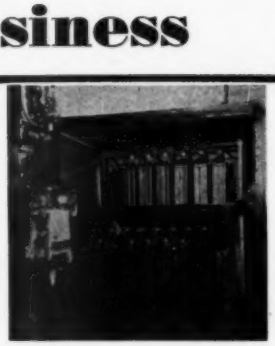
4 ..... Power Surveys Build Industrial Business

INDUSTRIAL accounts provide the principal source of business for the Eastern Electrical Engineering Company of Pawtucket, R. I. These customers are obtained and are being held on the active list through analyzing their operations closely.

At a time when factory operations slowed down, and business prospects likewise looked dull for this company, L. H. Beanlac went to work on a creative sales basis. If money was to be spent by industrials for electrical work there would need to be good reasons for such investments. Likewise, if his company expected more business than was normally in view, it would need to be developed. Good reasons for improvements had to be found that would appeal to the plant owner's judgment.

Power factor correction surveys have provided the best means of entering industrial plants. By making careful estimates of the customer's corrected energy costs on the basis of past billings, this company has been kept busy in the industrial field. The detailed surveys that were necessary to accurately determine the type and amount of capacitor equipment provided an opportunity to become familiar with plant conditions in general. In this way surveys were expanded to include other recommendations that effected greater efficiency or operating economy.

Among the jobs which have been developed by plant surveys, those involving capacitor installations for power factor correction came first. Once the customer has been satisfied that correct electrical equipment pays its own way, the path is clear to seek further means of correcting inefficient conditions. This has lead to modernized lighting systems, remotoring, correct drives and the regulation of demand charges.





The kind of work that results from power surveys

This 3-deck capacitor rack is operated at 1260 volts for correcting the power factor on a 220-volt system in a large machinery plant.

A 220-volt, 3-phase feeder tap, oil switch controlled, supplies this 220-1260 v., 250 k.v.a. transformer serving a capacitor bank in an adjoining room

Some of the operating conditions are such as to require variations from conventional practice. Recently a capacitor was installed for a 220-volt, 3-phase system, in which the cost of capacitors was held down by stepping the capacitor tap up to 1,260 volts, with a 250 k.v.a. transformer. At this higher voltage the cost of the capacitor bank was low enough to justify the investment. If this situation had not been carefully invesigated, a nice order would have been lost. As it now stands, the customer is pleased, and has other work to follow, all based on survey recommendations.

5 .... 200 Store Front Jobs in Two Years

PROPERLY timed contact with chain stores and other commercial concerns has sold over two hundred store front modernization jobs for the C & K Electric Company, Providence, R. I., during the past two years. Some of these customers have had work done by this company in other states, one job having been done at Washington, D. C. William Kelman estimates that his company has wired at least 90 per cent of such projects in Providence during this period.

Sales efforts for this type of work are begun long before the job is ready for bids to be taken. A close tab is kept on all vacant business buildings, upon all real estate transactions, and all sources of information

regarding leases, moves, expansions and the like. When an out-of-town concern closes a lease, correspondence is begun at once with its central offices. If it is possible to learn the identity of the display fixture contractor, a letter also goes there. These letters set forth the nature of the C & K company's work, some of its most modern installations, and also offer assistance in connection with local service conditions.

Early contact with store remodeling prospects offers a better chance to create modern layouts, more adequate facilities, and little refinements. After a job is once planned and out for bids, there is little chance to make suggestions.

Layouts are often built up by showing various photographs of other installations to the customer. Mr. Kelman takes pride in keeping a large number of such photographs handy at all times in his portfolio.

Signed orders for previous jobs are retained in the sales portfolio as important evidence to new customers. Such orders are usually on the customer's purchase order stationery, and are typed to describe the scope of work, as well as the contract price. These furnish indisputable evidence of jobs done for well-known firms, and are considered of too much psychological value to become filed away among other routine job papers. In addition to the photos and original purchase orders, the sales portfolio also includes testimonial letters from satisfied customers, as well as selected bulletins describing modern store and window lighting equipment.

One of the important requisites in working up store modernizations is that of Code rules and local electrical ordinances. The element of doubt as



to adapting new circuits and outlets to the usable portions of the existing wiring has caused Mr. Kelman to take particular care with regard to correct layouts. This phase of commercial work, while generally classed as engineering, has been looked upon as a valuable sales point and is claimed to be of utmost importance in dealing with busy field engineers. When jobs go through without argument, without complaints from inspectors or the lighting company, another satisfied customer has been made.

6. . . .Found Opportunities in Small Community Where Others Failed



E. Peterson

THERE were friends who likened E. Peterson to the green bespectacled steer roaming a sunbaked western prairie, when he gave up a journeyman's life in Metropolitan New York to go in business for himself at Babylon, N. Y. This small Long Island community had no new construction projects in sight, no industrial plants in need of modernization, and its business district was composed of but several blocks of typical community stores. Furthermore, several contracting firms had given up places of business on Babylon's main street during the depression.

The Peterson Electrical Service was started just the same, in October, 1934, and it now occupies a store building on the town's main street. Mr. Peterson has found plenty of business, has made friends, and treasures every new contact as a future business opportunity.

One of the important functions in his opinion is that of getting to the bottom of every customer's problem. This practice has developed numerous good sales opportunities. For example, a local institutional re-wiring job was built up to adequate standards because Mr. Peterson's investigations disclosed him to be the eighth contractor assigned to patch it up since the building was erected. His sales effort was based on straightening out everyone's mess for once and for all, rather than just do a patch job as was done by his predecessors. It worked, and a first class job was secured which amounted to more than $800.

Individual contacts are bringing in desirable small orders. An endless chain was begun through contacting key men among 300 state employees at the nearby district offices of Long Island's highway department. Some of these men have become satisfied customers, and their boosts have led to wiring jobs, appliance sales and repair business among their friends. These are people with whom Mr. Peterson would not otherwise have made such friendly contact in so short a time. Enough business is done to keep one salesman working in the residence section.

Building up a new business in this small town required a wider scope of activity than is required in cities. There is not sufficient volume to support contracting specialists such as are to be found in larger places. Therefore, this young man recognized the home-contact value of rendering radio trouble service. This work involves night calls to a great extent, which is fully capitalized in selling additional wiring and appliances while in the home. Bicycles are sold and repaired also. This furnishes another means of getting acquainted through the young community folk.

Having been an instructor in vocational training night classes, while

UMI

engaged in the trade, Mr. Peterson has made full use of this teaching slant in his own business. The boys on the job must know their job, and above all let nothing occur to mar the good-work reputation that is enjoyed by Peterson Electrical Service.

Mr. Peterson has thus established a going business in less than a year in what was pictured as a hopeless community. Friends may chide about green spectacles, and contractors of other communities may still be wearing blue ones, but in Babylon a hustling electrical contractor enjoys doing business away from the busy city that formerly claimed him as a big-job journeyman.

7 .... Motor Specialist Builds Business by Knowing Customers' Problems



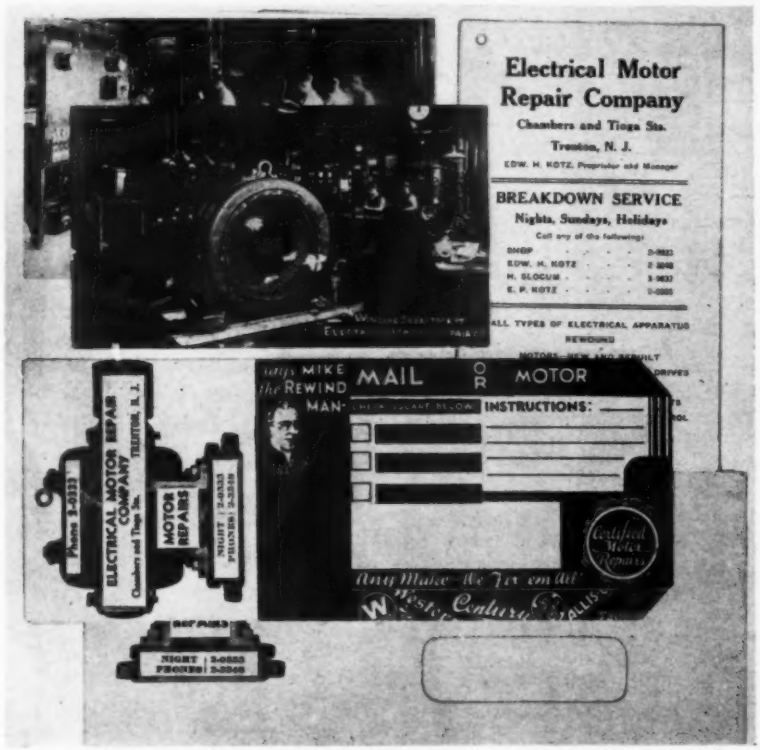
Edward H. Kotz

EDWARD H. KOTZ arrived at the Electric Motor Repair Company of Trenton, N. J., at eleven o'clock on a recent Monday morning, exactly as scheduled. He had secured five orders on this particular morning for various industrial equipment, which included some motors, starters and sundry replacement parts. Unusual, you say? "Why, no," says Eddie, "such orders constitute 80 per cent of our business these days, while only 20 per cent comprises motor repair service, and industrial wiring. And this morning's sales represent more net profit than my employees will produce for the entire day."

Although this company operates a completely equipped service shop which is a source of considerable pride to Mr. Kotz, he doubts the time-worn addage about the bigger and better mousetrap maker. In other words, busy executives do not care to beat a path to his doors. Their problems are in their own plants, therefore, the specialist must sell his way in, and find the path to that plant's source of troubles.

So we find that Mr. Kotz was unwilling to rely upon the telephone, occasional letters, and the routine courtesies of his workmen to promote the business relations of his company. He ventured forth as the proprietor-salesman of special industrial services and found customers, to his surprise, who were looking not for salesmen of motors, wiring or repair jobs, but for someone who would appreciate and correct their problems. These problems demanded experience in various phases of the business for which the wide-awake industrial service shop operator is ideally qualified.

Some Promotional Material



A balanced industrial set-up is maintained by this company. In addition to the motor service shop and an industrial wiring organization, it has acquired profitable contracts to handle reputable lines of motors, control apparatus, cranes and hoists, special drives, pulleys, instruments, etc. A study of special industrial supplies has prompted carrying stocks which are in quick demand, but for which the buyer required help in ordering the correct types. One of these items, for instance, is the industrial safety switch. Simple as this may seem, few buyers appear to know what constitutes the correct switch for a specific drive. However, Mr. Kotz has made it a point to know what his customers need, and gets their orders in sufficient numbers to justify carrying substantial stocks of such items.

These times require experienced sales-engineering, even in motor repair problems, therefore, Mr. Kotz is a keen observer of new develop-

ments for industrial use, and likewise maintains a library covering modern shop practice and motor winding data. Shop-men are trained in being able to carry on without the "boss," thus permitting him to engage freely in regular daily sales work among the industrial customers. This, then, extends the sales responsibility to those in the shop, where smaller details must be discussed with customers in person or by phone. Outside mechanics receive additional compensation for sales work. The miscellaneous outside sales of one mechanic yielded him over $400.00 in commissions in 1934.

In addition to personal contact, this company employs several practical methods to advertise its services.

1. A printed folder, punched at the upper folded corner for hanging on a nail, contains three printed pages of advertising matter and a view of the shop. The fourth page comprises a condensed set of useful wiring data and motor tables. This item is found to cause these folders to be kept on hand.
2. A novel punched-end mailing or shipping tag, sized to fit open-face envelopes, is used for direct-by-mail publicity at regular intervals.
3. Postal card photograph views of the service shop are sent out to new customers as invoice stuffers.
4. Manufacturers' mailing pieces with suitable imprints, are selected for stuffers, or to accompany direct-by-mail listings.

Here then is an organization operated to meet the changing conditions, a proprietor profitably maintaining close sales contact, and carrying the service shop, as well as his wiring service, to the buyer. This has meant more than routine solicitation of new business. Mr. Kotz sees fit to attend the local engineers' club, in order to meet the leading men in local industry and learn their problems. The good-will of plant electricians and technical men has been proven a distinct asset, therefore he recently arranged for various plant executives to give their men time off to make an inspection tour of a motor manufacturing plant in another city, the trip details also having been organized by Mr. Kotz. All of which is part of a steady program to bind closer ties with steady customers. Such carefully developed entree results in a type of business which is thus raised above the level of competition.

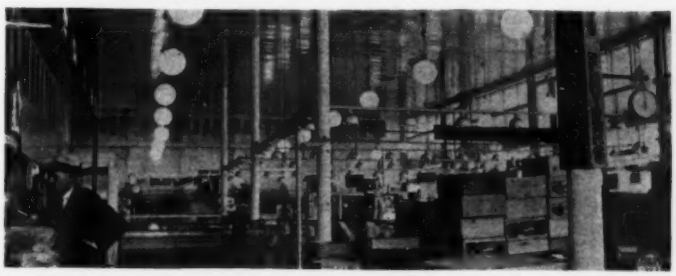
"One timers don't make us money, therefore, all our efforts are directed toward those customers whom we know need us regularly," says Mr. Kotz. Such active workers quite naturally must carry on in electrical family circles as well, therefore, Mr. Kotz is the 1935 president of the Central Jersey Electrical League.

8 . . . . Boosts Commercial Lighting Sales with 3 Light Lamp

Y. C. BRESSIE of the Bressie Electric Company, Portland, Ore., has materially increased his lighting sales through the active promotion of that frequently overlooked member of the lamp family—the three-light lamp.

Within the past few months he has made a number of important installations of commercial lighting, employing this lamp with a three-way switch, thus securing new wiring business and increasing his lamp and fixture sales at the same time.

The argument for this type of lighting installation is the fact that the average store, market, etc., does not require the same amount of illumination at all times, in order to adequately display the merchandise and permit the buyer to see it plainly. The store owner is therefore confronted with the problem of either installing and operating wattage more than is required for ordinary conditions, or else fixing upon a lamp, which, though adequate for average conditions, will not give enough light during certain periods.



Spath's Market, one of the Bressie installations with 3-light lamps in the suspended glass units.

The economy and flexibility of the three-light lamp under such conditions is obvious, but apparently has not been made clear to the commercial trade. By explaining about this flexibility, Mr. Bressie has been able to change over a number of large installations as well as wiring some new ones.

Heretofore, the 200-watt lamp seemed to have been the favorite for fixed installations. With the 200-300-500 watt lamp installed in its place in the globe ceiling units, and with a cord operated three-way switch, the owner has available the ordinary 200-watt illumination with the possibility of stepping it up at will in any part of the store, to the highest illumination requirement likely to arise.

Experience shows that the owner becomes educated to the higher intensities as an aid to his sales and operates more and more on the higher wattages.

UMI

9 . . . . Analysis of Industrial Sales Approaches

The first of a series of charts presented to help the industrial electrical contractor in creative selling

THIS issue of ELECTRICAL CONTRACTING inaugurates a series of "Sales Analyses Charts" designed to help the industrial electrical contractor in getting the best possible approach in selling his services and equipment to the industrial plant.

Briefly, the purpose of the charts is to translate electrical services and equipment into terms of the *self-interest* of the man to whom they are to be sold. The managements of industrial plants are, as a rule, not electrical specialists. That is not their business. Their immediate problems are concerned with the profitable manufacture or processing of the gadgets or goods they sell. Thus, they are interested in general working efficiencies, proper plant working conditions, speeding up of production, cutting plant overhead, and the thousand and one obstacles which today's competition places in the path of profits.

Obviously, the best way to sell such men electrical services and equipment is to strike them where their interests lie. For example, they are probably not interested in lighting equipment *as such*, but they are vitally concerned with reducing errors, increasing speeds in assembly and production, eliminating avoidable accidents, and the many other advantages which modern industrial illumination can bring.

Below is a chart that lists the services and equipment sold by the average well-equipped industrial electrical contractor. Along the top of the chart are listed the many items of *immediate self-interest* which are uppermost in the minds of those engaged in business today. The cross marks in the squares of the chart show how the industrial electrical contractor can translate his efforts into terms of this immediate self-interest.

Blanks have been left to enable the reader to make this initial type of analysis closely fit his own operations, by adding items peculiar to his business which may have been omitted.

Later issues of ELECTRICAL CONTRACTING will take up some of the specific problems present in all industrial plants, and present specific sales analyses charts on these problems, showing how particular services and equipment can be emphasized. Proposed special problems are "Speeding up Production," "Improving Working Conditions," "Increasing Safety," "Reducing Plant Overhead," and "Improving the Product."

It is hoped that this type of presentation will prove helpful in *creatively* selling the contractors' service to industry. Comments and criticisms on this sort of material will be welcomed.

A translation of electrical equipment and the contractor's services into customer self interest

UMI

UMI

Chart of Customer Self Interest Selling Approach for the Industrial Electrical Contractor

Industrial Plant Manager's Immediate Problems

Industrial Electrical Contractor's Services and Equipment

		SPEEDING PRODUCTION									IMPROVING OUTPUT					CUTTING COSTS						BETTERING WORKING CONDITIONS						OTHERS									
		Increasing speed and accuracy of workers	Speeding up machine outputs	Reducing handlings or operations per job	Insuring against idle machine hours	Minimizing avoidable delays—handlings, etc.	Closer control by management	Improving quality of product	Increasing versatility of machines	Taking the "human equation" out of jobs	Avoiding possible customer complaints	Reducing necessity for skilled labor	Making equipment more flexible	Reducing general plant overhead	Reducing power bills	Saving possible expensive machine repairs	Reducing labor content of operation	Increasing available factory space	Increasing worker comfort and health	Reducing plant noises	Improving "plant housekeeping"	Increasing safety													
Services	Re-inspection service—*wiring, etc.*				X									X						X	X															
	Changeover—*group to individual drive*											X		X			X			X	X															
	Changeover—*d.c. to a.c.*										X		X	X																						
	Load balancing				X									X																						
	High-tension metering													X																						
	Electrical maintenance service				X	X					X		X		X							X														
	Power-factor correction													X																						
	Check-ups on power-service contracts													X																						
	Illumination surveys—*foot candle readings*	X																X		X	X														
Equipment	Lighting equipment—*general and specialized*	X																X		X	X														
	Maximum-demand control													X																						
	Motor application—*characteristics to suit the job*		X						X			X		X																						
	Specialized motors—*hazardous, wet, dusty locations*				X																X														
	Motor starting and control equipment					X			X	X						X					X														
	Flexible electrical distribution—heavy-duty outlets				X	X						X																							
	Circuit protection—*fuses and breakers*				X																X														
	Modern switchboards and panels				X	X				X		X									X														
	Integral mounting of motors and control on equipment											X																							
	Automatic control—*time switches, limit switches, etc.*		X	X		X	X			X		X				X	X																		
	Phototube control—*counting devices, door openers, etc.*			X		X	X			X	X						X																		
	Communication systems—*interdepartment signalling*					X	X																												
	Ventilation—*fans and blowers*							X										X	X																
	Power transmission—*belting, speed-reducers, gearmotors*		X						X									X		X		X													
	Electric space heaters																	X	X																
	Electric heating—*immersion units, ovens*			X				X																											
	Recording and indicating meters, instruments	X					X			X	X	X																							

10 . . . . Eight Ways to Hold Speculative House Wiring at a Fair Price

1. ***"Smart" electrical features are home-selling aids. Help your builder plan them.***

2. ***Low promotion margins require the subcontractor to relieve the builder of numerous details.***

3. ***Inexpensive ideas which vary house interiors make each house interestingly different. Make your layout do its part.***

4. ***Use every electrical dollar available to provide layouts of greatest utility.***

5. ***Help every buyer to learn to like his builder and the home.***

6. ***Builders who can depend on you won't fall for a cheap competitive price without this extra service.***

7. ***Correct all mistakes and make all reasonable changes at once, even when it hurts. Extras are not nearly so hard to sell to pleased customers.***

8. ***Don't take on more customers than you can possibly give your undivided attention and supervision.***

THE seventy-seventh home is nearing completion out on Long Island, N. Y., in a development of the $10,000 to $20,000 class. One builder has handled this operation, and Wm. Berken of Jamaica, N. Y., has wired and fixtured each home. In addition, Mr. Berken has been handling several other large Long Island residential operations, some of a lower price class, but running into much larger numbers of residence units. These selected builder-customers keep a ten-man wiring crew steadily employed.

Each one of Berken's builder-customers looks upon him as the man who will help sell the electrical phases of their new homes. Likewise, as the families move in, every detail that has to do with the electrical service is taken care of personally by Mr. Berken. He travels at least eighty miles each working day to see his jobs, to keep in touch with families who have moved in, to assist in planning new residence units at the architect's office and to contact with the builders' field sales organizations for new ideas.

Thinking of residence work in terms of outlets, says Mr. Berken, means also the direct association with this term of a low price per outlet. Therefore, in his work there is a larger problem of correct and smart lighting to suit the architecture, the decorations, and the special ideas of the new owner. A close knowledge of the builder's budget limitations must be coordinated with the extra-cost touches that will suit the buyer, yet which add revenue to the wiring job.

Some little extra features which often go into "Berken-equipped" homes during construction include: (1) Recessed electric chimes. Often the customer goes in for the four-tone type, with several remote stations and key-boards. (2) Multi-control circular coves in the main stair hall, with color effects to blend with decorations. (3) The introduction of niches with concealed lamp hoods or reflectors, to accentuate an owner's prize statuary. (4) Flush lighting troughs for kitchen window soffits, for bathroom mirrors, and mantle shelves. (5) Tricky effects in "whoopee" rooms, for moonlight dancing effects, for amateur magicians, etc.

When a builder learns from his buyers that the electrical service is good, that the taste in lighting is attractive, that details were quickly corrected to suit personal preferences and without argument, and that the electrical contractor helps sell his homes, it is Mr. Berken's opinion that a fair price knows no cheap, meaningless competition.

At a time when contractors throw up their hands in despair about the residence wiring market, Mr. Berken calmly announces: "There is no depression for our shop, and we're specializing on residence work."

11 . . . . Uses Appliance Sales to Boost Wiring Sales

MANY contractors carry appliances as a sideline, some have given up appliances altogether, while others make appliances bring them business. Archie Cline, of Cline's Electric Shop, San Luis Obispo, Cal., is one of the latter. He has made appliances bring him wiring by salesmanship both of appliances and installation.

Located in a small city in the midst of an agricultural community, and aided by a friendly and cooperative utility, Cline's Electric Shop has made merchandise sales records during the past several years. This was done in spite of low agricultural prices and business conditions. But the point to be made here is that Mr. Cline himself, and his store personnel, too, make it a point to pay attention to the customer's wiring whenever there is an opportunity.

Whenever a refrigerator is sold, for example, and delivery is made, if the house has no convenience outlet

UMI

to serve the refrigerator, rather than do the usual makeshift job of running to some outlet with green and yellow cord, Mr. Cline sells a new outlet, and frequently additional outlets as well. He notes the condition of the lighting fixtures and awaits an opportunity to interest the housewife in good lighting equipment the next time she drops into the store.

In every way he keeps wiring in the position of an adjunct to the comfort, convenience, labor saving, and cleanliness of electric service. He has found that most contractors are so impressed by the work they are engaged in that they do not get the customer's viewpoint. To the customer wiring is a necessary evil unless some contractor has the skill to make it seem a desirable necessity. This is the approach that Mr. Cline uses and it is one which he has found produces business.

12 . . . . How Contractor Can Cash in On Better Light—Better Sight

By Roy A. Palmer
Illuminating Engineer,
Duke Power Company,
Charlotte, N. C.



THE Better Light—Better Sight activity is now entering upon its third year. No other movement conducted by the lighting industry has been so thoroughly successful and far-reaching as the cooperative campaign promoted during the last two years. The humanitarian appeal of the theme of the activity—sight saving,—has made the nation sight conscious which also brings better lighting to the forefront in the minds of the public.

This means that there has been created an acceptance for better lighting the like of which has never existed before. Advertising in trade journals, popular magazines, bill boards and newspapers has carried the message of Better Light—Better Sight to millions. Window displays, lighting campaigns by utilities and thousands of personal contacts by lighting specialists have further promoted the idea. Last year half a million I.E.S. type lamps were sold which demonstrated to the public that good lighting can be had in the home for seeing easily and safely. These lamps have, in effect, created the thought that if good lighting is available for the home, why is it not possible to have the same seeing comfort in the office, store or industrial plant?

With all of this promotional effort there has been built a background that hides a veritable treasure-chest of opportunities for the wide-awake electrical contractor. But these opportunities will not come to him of their own accord. Here is what it takes to find and to open up that treasure chest: Initiative, a general knowledge of how to provide good lighting, a sight meter, and a willingness to use shoe leather.

In the first place, the contractor must get away from the time-honored custom of waiting until a job comes up before he takes action. Such jobs are reeking with competition which reduces opportunity to sell the quality of lighting job that the customer should have and consequently reduces the profit. The jobs must be created. The contractor must have sufficient initiative to select likely prospects, determine in advance what must be done and how much it will cost to provide good lighting and then call on them to tell them the story.

This procedure may sound like the same old hokum so often promoted by chair-warming salesmanagers. But this is different because it can be made to click. The sight meter creates that difference. It makes the lighting job tangible to the layman. It removes doubt because it guarantees the lighting result for which he pays his money. The sight meter creates interest and opens up opportunities for selling the sales story.

Generally speaking, the customer is ultimately interested in only two things: "Will I get the kind of lighting which will permit me to see comfortably and without danger to my eyes?" and "How much will it cost?" The details such as wiring, fixtures, lamp sizes and similar items are only of incidental interest. Therefore, be thoroughly prepared to answer these questions and direct the sales story mainly around them. Remember, the lighting result is the reason your prospect is at all interested. The more you can impress him that the amount and quality of the illumination on his desk is directly affecting his most precious possession—eyesight—and that his comfort, welfare and future happiness will depend largely on his eyesight, the more easily will he be sold. More than likely he has already been impressed with the Better Light—Better Sight advertising. Cash in on it!

Avoid technical references. The word "foot-candle" was purposely omitted from the scale of the sight meter. Instead, the scale is divided into sections appraising the illumination from a seeing standpoint in terms readily understood by anyone. All the prospect needs to be told is that the needle should point to 20 to assure comfortable and safe seeing in an office.

Obviously, it is of considerable advantage, if not absolutely necessary,

for the contractor to have well in mind before calling on his prospect the wattage necessary to produce that illumination, the type of fixture necessary to assure low brightness, whether or not additional wiring is necessary, whether or not repainting is necessary, and if so, how much it will cost and finally, the figures for which the new lighting system will be installed. Armed with this information, he can speak to his prospect definitely and concisely which will win both respect and confidence.

Another point which is well to have in hand: Every contractor should be thoroughly familiar with the electric rates of the local utility. It has been both amazing and shocking to me to find contractors who know little or nothing about the electric rates. I have found several instances where contractors lost jobs because they wrongly estimated operating costs. An electrical contractor is in the electric business. Why shouldn't he be able to estimate correctly the cost of operating the equipment he installs for his customer?

The contractor who is not cashing in on the market created by the Better Light—Better Sight movement is missing a bet. The selling procedure outlined above is not theoretical—it's practical because contractors who have tried it are finding to their satisfaction that it works.

13 . . . . Six Point Sales Policy Builds $10,000 Monthly Volume

1 Work out the owner-benefits of every job recommendation and make this the sales objective. Executives haven't time for work-solicitors, but will listen to beneficial proposals.

2 Draw on your past experience to find the interesting possibilities of your customer's problems. Interpret every solution in terms of customer advantages, and don't let jobs become commonplace routine.

3 Learn the plant conditions and requirements to an extent that you advise about equipment, instead of merely quoting on it. Experienced assistance sells motors and other equipment at a profitable discount.

4 Develop the good will and co-operation of supply and equipment salesmen. Leads, contacts and timely tips about proposed changes or additions will result from these sources.

5 Cultivate the good will of plant mechanics and building superintendents. Help them rather than "show them up." Good orders will trickle in as a reward for this thoughtfulness.

6 Hold down the sales effort to good leads secured from personal contacts and from trustworthy friends who knew about your work and your sales policy.

A $60,000 volume of industrial and commercial business composed of orders running below $7,500 was done during the first six months of 1935 by a 2-man industrial contracting organization. These two men contacted, estimated, followed up, and finally supervised the many jobs comprising this volume without additional overhead expense. This was accomplished by utilizing the aid of sales engineers, equipment salesmen, plant superintendents and building managers to develop leads for new business.

The Wright Electric Service Company of Newark, N. J., engages in a general line of commercial and industrial work, equipment sales and motor repairs. A. H. Koellhoffer, president of this company, and M. C. Wright, the secretary-treasurer, claim thirty-five years' experience in the business. Both having seen panics and depressions of earlier years, their business methods were adjusted to meet present conditions. They sought efficient operations with a minimum of lost motion. A program of creative sales work was therefore established that got results for this company among a wide list of customers, and which made the most of every booster for this company. The following six-point sales policy was formulated as a contact-building medium which is still working as satisfactorily for its sponsors as when it was begun a year ago.

Outside aid is being recruited for creating business in an inexpensive manner. Equipment salesmen who received assistance from this firm on electrical problems reciprocated by giving out good leads on installations. Some of these problems reveal plant conditions that require the experience of a contractor. Valuable leads are thus obtained.

Although some contractors dislike handling lamp contracts, this company welcomes them as an additional service connection with prospects for other future business. Each transaction with an industrial or commercial customer provides a means of renewed contact, and lamp orders are no exception in this company's case. This company's equipment sales record is said to rank first for the community with one large manufacturer of motors and other equipment.

Tips which are obtained through salesmen of various lines are not acted upon until after it has been possible to learn about the plant's operating problems. Calls are made only when a real clue has been uncovered, and after a solution of the trouble has been considered carefully enough to form a sales objective. Sales calls, whether to sell equipment or to sell a wiring job, are given a courteous reception, says Mr. Koellhoffer, when one presents a plan which offers the customer definite benefits. When these calls are restricted to good prospects whose troubles are fairly well known in advance, the business operations can move smoothly at minimum cost of operations.

UMI

14. . . .Made Thorough Study of Ventilation

WHEN you have only a modest business in a large city it is a good idea to learn to do something especially well—much better than anyone else can do it, and then sell that knowledge along with your workmanship. At least that is what Clare T. Smallcomb, electrical contractor located at 507 East 7th St., Los Angeles, Cal., has found. His particular specialty has been ventilation, and he has used his knowledge of this subject to sell many fine jobs at his own fair price. He has used this knowledge to lift him out of the dog-fight of competition for many years. And many times a satisfied ventilation customer has brought him work along other industrial and commercial lines.

Originally Mr. Smallcomb started out in a small way with a motor shop and wiring business. In such a field he found plenty of competition, both from bigger shops and smaller. It was not long until he noticed that few contractors seemed to appreciate the market for ventilating equipment, and in fact knew very little more about ventilation than the fact that a motor had to be connected up to run the fans.

When he found this condition Mr. Smallcomb decided to make the most of his opportunity. He read all he could on ventilation and handling of air, and when he had an opportunity to develop some business could talk with authority and give satisfaction in performance. He soon found that ventilation involved more than merely a motor and blower or fans. Ducts and control equipment were involved in almost every job. Arrangements were made then to have a sheet metal shop connection so that he could give his customers a complete job under his own supervision.

To sell ventilation, as well as motor repair and rewinding, and wiring, too, Mr. Smallcomb uses personal advertising. That is he supplies his customers and prospects with reminders of his service in the way of blotters, circulars, scratch pads and such other useful advertising pieces.

15 . . . . . Campaigns Produce Extra Wiring Business

AN electrical contracting and dealer organization that was begun in 1895, and which today numbers forty employees in its two places of business at Cambridge and Boston, Mass., has proven to its satisfaction the benefits to be derived from its own special campaigns for wiring business. Although the sales crew of the Clark and Mills Electric Company is in daily contact with old customers, and is building up new accounts until they now number 4,000 charge accounts, it has been possible to create additional business through a well-planned wiring campaign in which every employee cooperates.



The Clark & Mills staff at the last wiring campaign sales meeting

During its first campaign, held in 1932 for five weeks, it was found that $10,000 of new wiring business resulted. A similar campaign was conducted in 1933 which produced $20,000 in wiring jobs. Because two appliance sales campaigns were conducted in 1934, no wiring activity was carried on that year, but another campaign is planned for this fall. From the experience that was gained during its two previous efforts it is expected that a further increase in volume will result.

Because the entire organization was concentrated upon creating new leads for wiring jobs, about 50 per cent of these fell through or were postponed for various reasons. Among the various wiring jobs secured was a residence in which the wiring system had operated for

twenty-five years. The old wiring in this home was completely removed and replaced with new wiring at a cost of $1800. A large amount of the work consisted of modernizing the wiring systems in old residences, institutions and commercial structures. Thus it will be seen that this type of campaign depended for its success upon "digging up" jobs from nowhere. No particular attention was given to new construction because these campaigns were too limited in time for such sales effort to bear fruit.

Promotes Company Inspection

Believing that all wiring installed years ago has suffered serious deterioration to a point where its insulation is no longer safe, these campaigns have been focused upon the need for inspecting the defects in old wiring. From these inspections, which were conducted by two experts of the company without charge, the principal elements of safety, of fire hazards, and of inadequate service and circuit capacities could be made into reports. Estimates based on such reports were then prepared for all the leads that were secured.

The first step which inaugurated each campaign involved the preparation of the personnel for the campaign. A series of meetings were held at which lectures were given by outside authorities on subjects relating to the wiring market. At the same time each employee was given a quota of leads to be obtained. A direct mailing program also was tied in, for which each employee was given a quota of new names to be secured.

A schedule of commissions was prepared which applied as extra compensation to leads turned in by wiremen, office employees and salesmen. Another commission scale applied to actual wiring sales secured outright. Foremen, superintendents and crew managers were likewise included under equitable percentages so as to encourage their full and enthusiastic cooperation throughout the campaign period of five weeks. The first step in dealing with the wiring prospect was to secure consent to a free inspection report. It was then the job of an inspector to report his true findings.

One of the most valuable means of convincing owners regarding the need of modern wiring was found to be the megohmmeter. Insulation tests on old systems showed a wide variance of values, many in which the insulation was above 70 per cent gone. Because only two men were given this testing responsibility, they soon acquired the fine points of the work. Often these men had been at the premises before while doing other jobs, therefore they were known. This bit of customer acquaintance became invaluable when it was necessary to explain the whys and wherefores of leaky insulation, overloaded conductors and other items brought to light by these inspections.

Here, then, is a campaign which is conducted for the purpose of doing big things where nothing appears worthwhile on the surface. Additional outlets and switches are commonly associated with such a program. Instead, this is a bold effort to get real jobs, the replacement of worn-out, leaky wiring in good structures with a new, high-test system. Such work involves estimates in the hundreds of dollars, and it is not unusual for them to exceed $1,000.

The net results of this company's wiring campaigns have already been given in dollar values of new business thus created. In addition to such sums more jobs have resulted later on because of the intensive campaign that was carried on. Moreover, the widespread advertising which was made a part of these campaigns, from direct mailings, newspaper advertising, personal canvass, and neighborhood discussions represented intangible values that played a vital part in a steady flow of business for the remainder of the year. By planning a campaign for all its employees, and guiding them in their customer approach, and in the elementary objectives sought, it has been proven a worth while undertaking. It will be continued this year with greater enthusiasm by the rank and file of the Clark and Mills organization.

16 . . . . Build Wiring With Oil Burners



An oil burner window display

THE Collins Electric Company, Inc. of Springfield, Mass. has made oil burners an important part of its complete home electrification service, and by so doing adds wiring busines for the contracting department. Having played a leading part for years in selling quality wiring fixtures, and major appliances, this oil burner department has been ushered in to give a still broader scope of operations.

About eighty oil burner sales were made this year. All of these sales brought also a wiring and installation job. Some sales were made to customers that had previously purchased a refrigerator, washer or ironer. Likewise, where the oil burner sale opened a new account, a new contact was made for further wiring jobs and appliance or fixture sales.

Appropriate window display space has been allotted the oil burner department. A special salesman works up these cases for the other men, while he himself devotes all spare time to general appliance sales. The complete installation is made by the Collins organization thus bringing about an expansion in both installation and sales volume that has been welcomed during periods of curtailed construction activity.

Construction . . Methods . . . .

Wall Bracket for Panelboard

Steel bars were used for making wall brackets with which to set power cabinets out 4 in. from the wall. These bars were ½-in. by ¾-in.



and were bent into "U" shapes. The legs of these shapes were drilled for inserting wall bolts, and cabinet supporting bolts. The spacing of this cabinet permitted several conduits to be stubbed through the floor in the clear of obstructions on the ceiling beneath. Ralph J. Walter, electrical contractor of Bethlehem, Pa., employed the above method on an industrial modernization job.

Ceiling Wireway Reduces Massed Conduits

In providing a high intensity lighting installation for a chain manufacturing plant at York, Pa., the Industrial Electrical Construction Company, local contractors, avoided the accumulation of numerous home run conduits on a mill construction ceiling by installing a factory-made wireway. This wireway was extended upward from the panelboard and installed at the ceiling centerline, lengthwise of the building. Although the layout consists of 500 R.L.M. reflectors hung on self-aligning pipe stems on 11-ft. centers, this densely equipped lighting system has a minimum amount of exposed conduit runs. The wireway was installed edgewise against the face of the ridge rafter, with



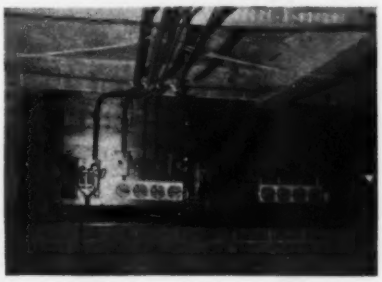
the hinged access covers opening outward rather than downward. All right angle runs were taken away from the bottom wall of this wireway by means of angle fittings.

Consolidated Meter Distribution

In remodeling a commercial building at Kingston Corners, Pa., nine different services were removed and replaced with one enlarged service while certain tenants were kept supplied with energy. A new meter location was provided and fed with three 750,000-c.m. cables by means of a 5½-in. by 6-in. metal wireway which was run horizontally below eight meter fittings and several large sub-feeder switches. The service conductors are run from the main switch, located in another part of the basement, to a point on the opposite side of meter board partition, at the top of the vertical wireway. A 3½-in. conduit elbow laid horizontally, passes through this wall and enters the back of the wireway. Five conduits were run upward from their respective switches and supported at the ceiling upon angle iron headers which rest



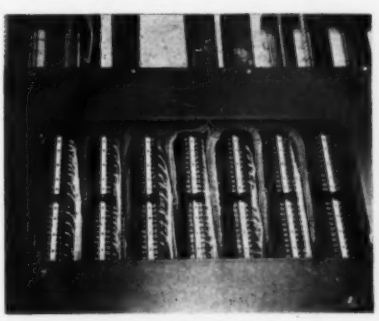
Before and after views



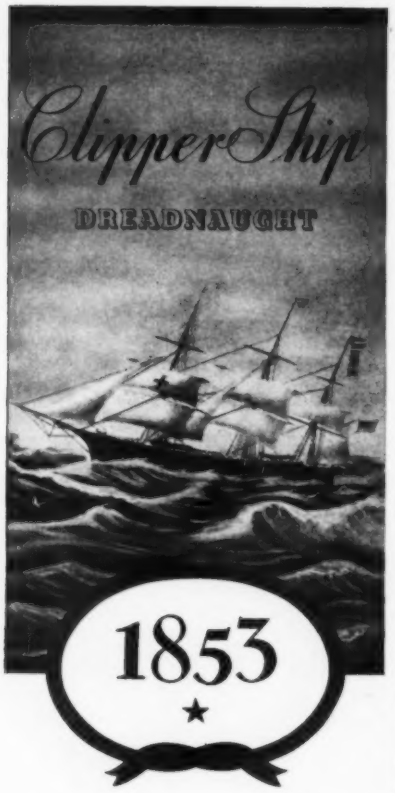
on the flanges of large floor beams. This supporting position kept these conduits low enough to be elled off and run below those beams without unnecessary bends in these runs. This installation was designed and installed by the A. J. Sordoni Construction Company, Forty Forts, Pa., and the Popky Engineering Company, Wilkes Barre, Pa. The original installation is shown above.

Accessible Border Light Cable Splices

The change from single solid conductors to stranded muitiple-conductor borderlight cables in theatres usually involves a gridiron junction or splicing box above each border.



The large borders that are used in the recently re-wired Metropolitan Opera House, New York, N. Y., were



BUILT in Newburyport, Mass., in 1853 . . . registered 1227 tons . . . In 1859 she made the 3000 mile run from Sandy Hook to Rock Light, Liverpool, in 13 days and 8 hours . . . In 1860 went from Sandy Hook to Queenstown, 2760 miles in the unequalled sailing time of 9 days and 13 hours . . . RECORD PERFORMANCE.

★

SHAWMUT FUSES

have a continuous record performance protecting electrical equipment for over 40 years.

SHAWMUT LAG RENEWABLE FUSES

Like the Dreadnaught, they are sturdily built . . . their construction permits speedy renewal.

FOR RENEWABLE FUSE PERFORMANCE ask your Jobber for SHAWMUT LAG RENEWABLE FUSES

★

UND. LAB. APPROV.

THE CHASE-SHAWMUT CO.
Newburyport, Mass.

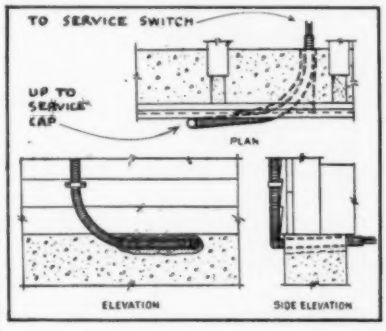
Fuse Specialists Since 1893

provided with locked terminal cabinets instead. The E-J Electrical Installation Company installed home run conduits between the reactor boards and separate terminal cabinets for each border. The flexible cables were enclosed in conduits from these cabinets to near the centerline of gridiron, from which point they were suspended to their respective borderlight conductor compartments. This method offers important future maintenance advantages by assuring a neat and readily accessible conductor arrangement.

The terminal cabinet for border No. 7 is supplied by 148 No. 10 solid circuit conductors in two 3½-in. conduits. This border is supplied by three cables, each consisting of 50 No. 10 stranded conductors. Each cable is enclosed in a 3-in. conduit to the point of suspension from the gridiron. The various conductors were laced in groups between the tiers of terminal blocks, thus leaving all connections readily accessible for quick testing in case a breakdown should occur in either end of these circuits. Spare conductors were provided in both directions to provide future leeway, thus avoiding the need for repulling these long runs should several conductors become grounded.

Installing Armored Service Cable

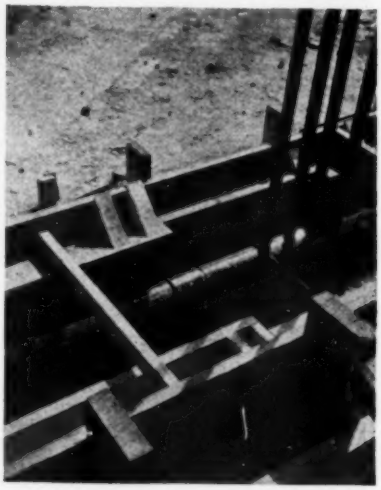
Armored cable services should enter the building walls without "bulging" and should also be slanted to drain toward the outside of building. This installation method necessitates a large slanting slot, whether the



original wall opening of a smaller service is used, or whether a new service is being installed. After the cable has been made secure, the opening through which it passes into the building should be made watertight. Where the cable enters a building through walls of wood construction, a horizontal run of at least 18 in. should be provided. The opening should be bored at an angle of not more than 45 deg., and slanted upwards. The foregoing methods and illustrations which comply with the rules and regulations of the Hydro-Electric Power Commission of Ontario, appeared recently in "Electrical Appliances and Supplies," a Canadian publication.

Supporting Fibre Conduit In Curbing Forms

The installation of single 3-in. fibre conduits in the curb forms of a viaduct was recently simplified by tying it to the form cross-tie wires Twin No. 8 solid iron wires were



used by the form contractor at 34-in. centers, these being twisted taut to clamp the opposite form members together. The fibre conduit was then run above these tie wires, and tied to them at each supporting point with No. 12 solid iron wire. The Blumenthal-Kahn Electric Company, Baltimore, Md., found that this method simplified the assembly of runs, their alignment, and also permitted the concrete to be more easily poured into the form.

Cabinet Alignment Above Rough Floors

Unfinished ground floors offer little means for supporting free-hung cabinets from overhead conduit nipples, yet they must be accurately aligned to meet partition lines. Three small cabinets were installed under these conditions in the State Office Building addition at Providence, R. I., by the Hughes Electric Company of that city. After all branch



There's no reason to fear the telephone after a job is finished. You can be as sure of your products as you are of your workmanship. Use General Electric White Rigid Conduit, BX Armored Cable, Fiberduct. Satisfy your customers . . . eliminate complaints.

G-E White Rigid Conduit provides permanent protection for all wiring systems. It is made of the finest materials . . . resists heat, flame, moisture, acid. And where G-E "White" is not required, use G-E BX Armored Cable. It can be used in new circuits or in extending old ones. Both G-E "White" and BX have a complete line of Boxes and Fittings. Both are known for their ease of installation . . . dependability . . . long life.

For office buildings and factories, G-E Fiberduct provides a complete flexible underfloor wiring system. Fiberduct puts the outlets for light, telephone and signal systems where they're wanted and when they're wanted without costly remodeling.

All these General Electric products are designed for use as individual units or as part of a completely General Electric wired system. They can be installed in new or old buildings. Send today for bulletins giving complete information. Write Section CF-489, Merchandise Dept., General Electric Co., Bridgeport, Conn.

GENERAL ELECTRIC

Wiring Materials

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

UMI



Type M1

The

Badger

50 Ampere

SYNCHRONOUS TIME SWITCH

A low-priced quality time switch furnished in both the synchronous and 8-day hand wound types.

It is made by "Reliance," manufacturers of high grade time switches for a quarter century, and has been designed and built to meet a demand for a low-priced time switch with a capacity great enough to meet a wide variety of requirements.

All types fully approved and listed by the National Board of Fire Underwriters. The switch is revolutionary in design, embodying self-adjusting "floating contacts" which insure positive contact and uniform tension.

Sell this low-priced high-quality time switch to all your customers and eliminate expensive service calls.

GUARANTEED

All "BADGER" time switches are guaranteed within the United States against defective material and workmanship and any parts proving defective within one year from date of installation will be repaired or replaced without charge.

LIST $18.00 and up

RELIANCE AUTOMATIC LIGHTING CO.

1937 Mead St.

Racine Wisconsin

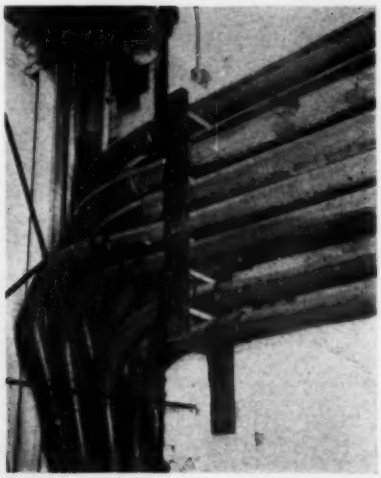
circuit and feeder conduits were nippled into the tops of all cabinets they were fastened in place so as to occur flush in a partition which was to be erected before pouring the



ground floor concrete. A horizontal 2-in. by 4-in. timber was placed over the flanges of the three cabinets and tied back to a horizontal 4-in. by 4-in. timber that overlapped a pair of columns behind the cabinets. Four sets of heavy tie wire was twisted until the cabinets were sprung into a rigid and plumb position flush with the partition line. Because of their secure alignment, it will not be necessary to stand by these cabinets while the partition is being built.

Strain-Relief for Massed-Conductor Risers

Twelve 3-in. and 3½-in. conduits, enclosing about 900 borderlight circuit conductors ranging from No. 10's to No. 6's, were run vertically for 80 ft. to the gridiron space of a large theatre. In order to provide strain relief for the large number of wires in each conduit, standard ells were used at the upper end of each conduit. Thus a 90 deg. deflection occurred by continuing horizontally with these conduits to their respective terminal cabinets. A deep pull box, designed to fit the recessed risers would have saved the E-J Electrical Installation Co., New York, N. Y., some of the cost for ells and conduit off-setting labor. This saving would have been wiped out,



however, in providing special strain-relieving equipment for the large number of conductors which occurred in the limited working space. A wall bracket made of 3-in. steel channels and ½-in. through-bolts was installed in the horizontal runs, next to the riser ells. This supported the upper part of riser.

Radio Silencing Switch

In wiring the "Magic House," an exhibition home at Kansas City, Mo., the 110-volt radio outlets were provided with a tumbler switch at the



telephone nook. When a phone call is made or answered, it is possible to silence the radio quickly without shutting it off at the set. Likewise, when the conversation is finished, a flip of the tumbler switch restores the radio program. This switch was ganged with a switch which is used to control a semi-flush light located in the arch of the telephone nook, which floods the instrument dial.

UMI

UMI

BRYANT

SUPERIOR WIRING DEVICES

A new idea

A new way to add convenience outlets decoratively and with color

A new and novel method of installation

A new and approved material to eliminate objectionable cord extensions

Wires are carried in separate channels in this insulating raceway. (Shown actual size.)



Circuit can be "tapped" at any point to install this neat, compact duplex receptacle.

Flexible raceway is cemented to wall with special AddHere cement. Note corner bend without elbow fitting.

BRYANT ADDHERE

surface extension wiring

Here, at last, is the *practical* answer to a problem that has long beset the electrical industry—the addition of outlets in already-wired buildings at low cost, with an approved wiring material.

To the electrical jobber, it means an opportunity to increase wiring volume and profit.

To the electrical contractor, it means the long-looked-for opportunity to re-enter the wiring business in the only big market of today—millions of already-wired buildings.

To the public utility, it means more *usable* load-building outlets, less trouble-shooting, and more satisfied customers.

To building owners and managers, it means outlets that can be easily and inexpensively changed to suit the demands of tenants.

To people everywhere, it means an end forever to the inconvenience and risk of long, loose cords and "home-made" wiring jobs.

Recognized by Article 516 of the National Electrical Code. Listed and Labelled by Underwriters Laboratories, Inc.

UMI

SAFE · · MODERN · · INCONSPICUOUS · · ·

Bryant ADDHERE is an entirely new and different method of making surface extensions

Starting the "Run"

The circuit is easily picked up from an existing convenience outlet by the use of an AddHere frame, in color to match the raceway. If desired, more than one run can be brought out from the existing outlet.

Installing the Raceway

AddHere Raceway is cemented permanently to surfaces by the use of a specially developed cement. No tacks, no nails, no screws! Installation is made easily, without noise, muss or dirt.

Adding Outlets

Outlets can be easily added at any point in the run, by installing the compact AddHere duplex receptacle. This receptacle is provided in colors to match the raceway.

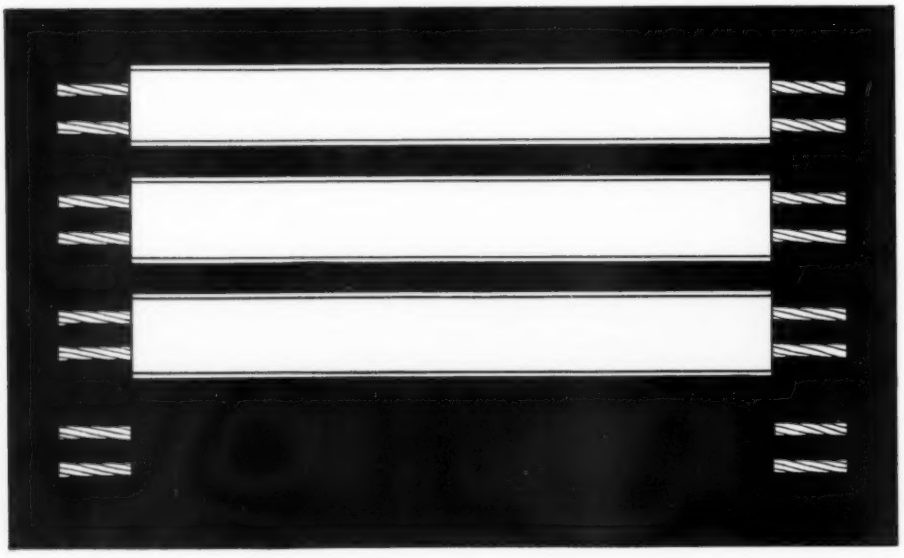
How Run Is Extended

The run of AddHere raceway can be as long or short as desired in the room in which it originates. Neat, inconspicuous and flexible, the raceway can be fitted snugly around door or window frames to make a complete "loop" of the room—always desirable for future convenience. It can be carried inconspicuously in corners up to the picture molding for the installation of the ingenious AddHere Pendant outlet, shown on the opposite page.

Important Sales Policy

AddHere is available only through authorized Bryant distributors, to be sold by them to competent or licensed electrical contractors for installation. This is a strict policy to protect the legitimate electrical trade.

Bryant ADDHERE Raceway and Fittings are in four colors to match popular interior finishes

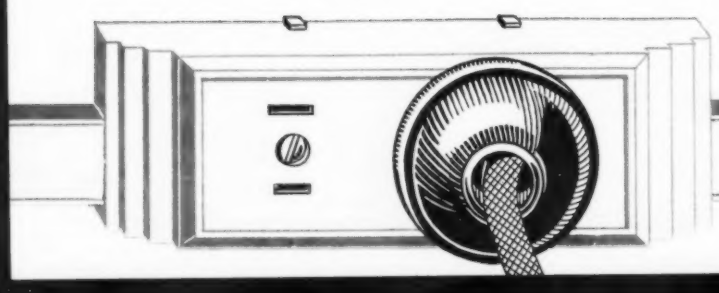


WHITE

IVORY

GREEN

BROWN



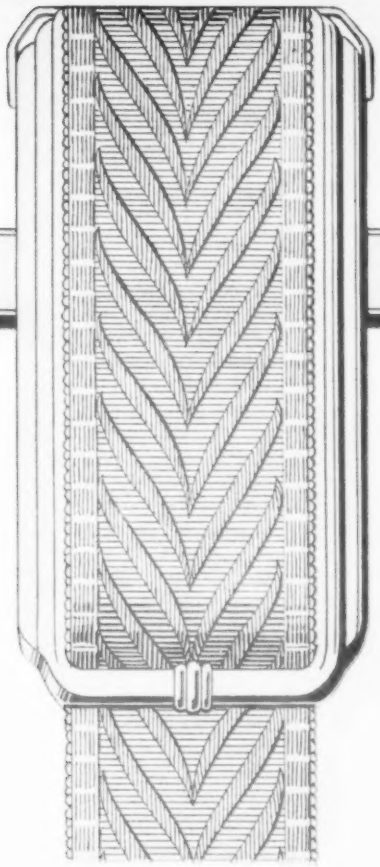
UMI

CONVENIENT

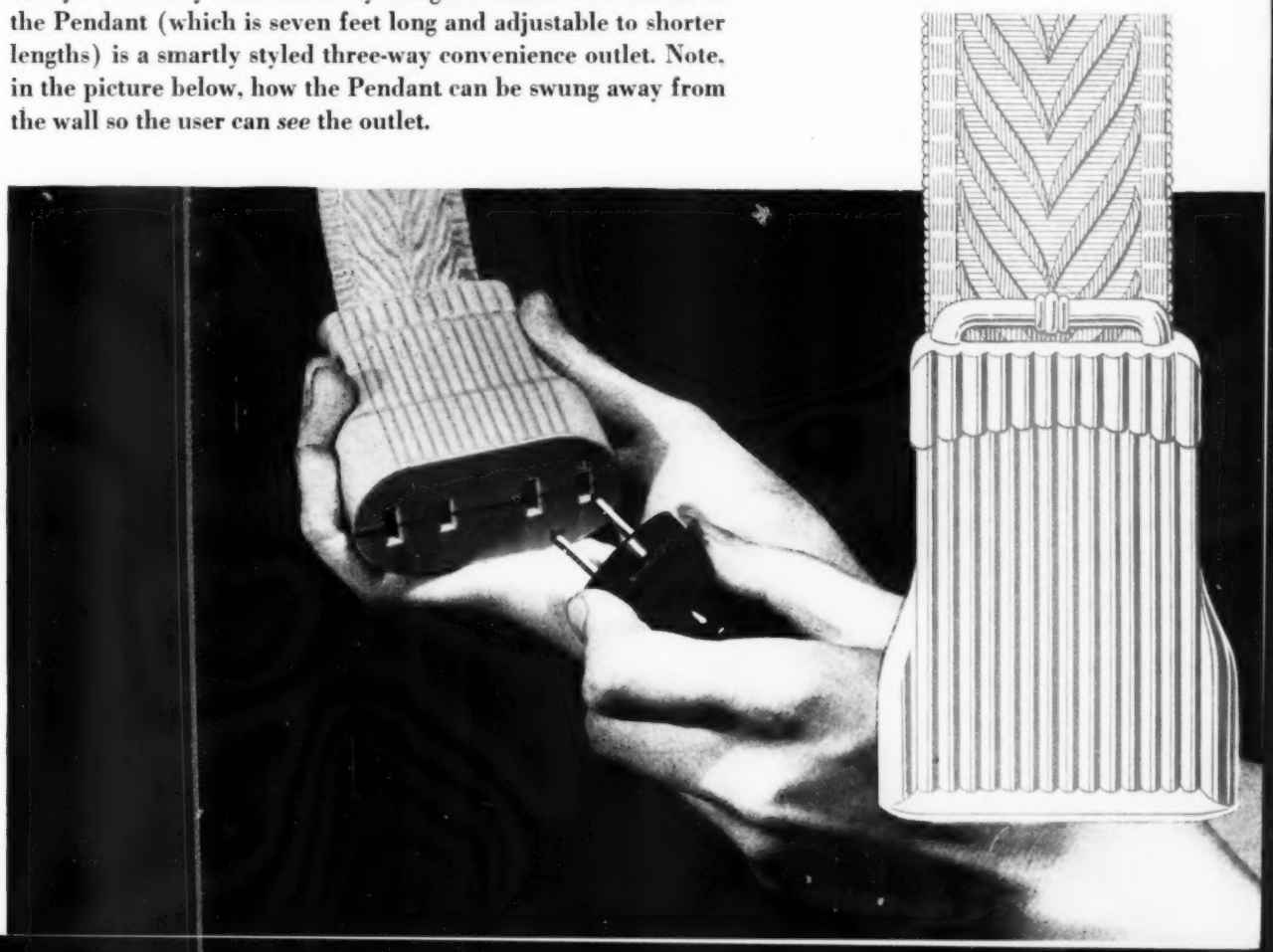
New too

—THE BRYANT ADDHERE PENDANT

Here is the *first* and *only* wiring development by which electrical outlets can be readily installed or re-located on side walls at any desired height or position. The Bryant AddHere Pendant "taps" a run of AddHere Raceway near the ceiling with a special fitting, firmly anchored in place. The insulated wires in the Pendant are safely covered by an attractively designed fabric. At the end of the Pendant (which is seven feet long and adjustable to shorter lengths) is a smartly styled three-way convenience outlet. Note, in the picture below, how the Pendant can be swung away from the wall so the user can *see* the outlet.



Pendants are available in six scientifically selected colors to blend with wall decorations. White, Ivory, Tan, Gold, Peach, Green.



UMI



Here, a difficult wiring problem has been solved inexpensively and attractively with Bryant AddHere. Notice the two pendants on the chimney breast providing outlets for the lamps on the mantelpiece, which ordinarily would be wired with long, unsightly cords. Notice, too, how inconspicuous the AddHere raceway is beneath the picture molding and above the baseboard.



An AddHere Pendant between twin beds provides handy outlets for table lamp, bedhead lights, electric clock, warming pad, electric heater, etc. No stooping, no fumbling, when appliances are connected or disconnected.



A convenience undreamed-of before. See how the AddHere Pendant, placed at a buffet, can be conveniently used for electrical appliances. And notice that the user can make the connection without effort.

Sell Bryant AddHere for electrical modernization under F. H. A.

For complete information write

THE BRYANT ELECTRIC COMPANY

ADDHERE BRIDGEPORT BRYANT CONNECTICUT ADDHERE

NEW YORK CHICAGO SAN FRANCISCO



End fitting for terminating AddHere run

DM-101—60M—8-35

UMI

THE BULL DOG LINE IS CONTINUALLY EXPANDING TO YOUR GREATER PROFIT

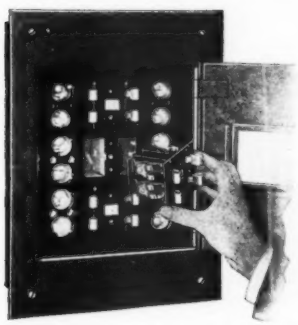
The NID Line



The NID Line — the New Ideal Switch for Electric Refrigerators, Oil Burners, Air Conditioners and all Motor Circuits up to 3 H.P., 115V., 125V. and 250V.

Features, floating contacts with "arcing tips", unbreakable steel handles and frictionless knife-edge bearings which preclude lubrication. Unique in design and value.

Switch Centers



Switch-Centers—A line of Switched Fusenters incorporating the husky NID 30 Amp. Toggle Switch as an integral assembly. Gives switched-fuse control with its greater safety for a trifle more than the cost of fuse only cabinets and is vastly superior in all respects to the synthetic fuse cabinet with gang switch plate.



You can secure more

Wiring Jobs

by offering and using new, individual and distinctive

BULL DOG

Products like these

The 55,000 Line



The 55000 Line of Combination Entrance Switches, Range and Lighting Distribution Cabinets for "Meter-Switch-Fuse" sequence. Designed from a practical wiring stand-point, for Surface or Flush mounting, this Line has met universal approval and is specified as Standard by many Power and Light Companies.

Wire Grips



BullDog Wire Grips—the Better Solderless Lug — being neither Castings nor Forgings but "Cold Flowed" to shape are made of Pure Electrolytic Copper for Highest Conductivity and Greater Mechanical Strength. Only 5 items required to cover the complete range of sizes from No. 14 wire to 1,000,000CM Cable: the Minimum in Stock investment thus ensuring the Maximum in Service.



BULLDOG ELECTRIC PRODUCTS CO.

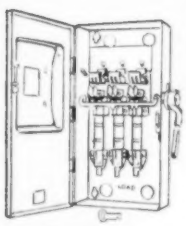
DETROIT MICH. U. S. A.

Manufactured and Sold in Canada by BULL DOG ELECTRIC PRODUCTS OF CANADA, LTD., *Toronto, Ont., Canada*

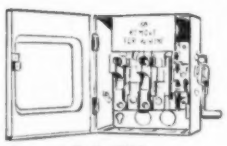
UMI

THE TREND IS BACK TO QUALITY

● The depression brought a flood of shoddy merchandise to satisfy the demand for ever lower prices. Now buyers are realizing two things—that they get less than their money's worth at the lowest prices—and that quality at the right price is the only sane and economical buy. *The proof of that is in the rising sales today of all good products which were not cheapened to sell in a price mad market.* Business-wise contractors and alert independent wholesalers everywhere feature C-H Safety Switches for *today's* demand.



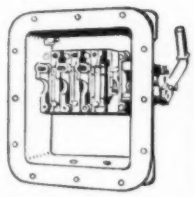
Bul. 4101
Current Breaker
Mill Duty Safety Switch



Bul. 4115
Safety Switch
Universal Duty Safety Switch



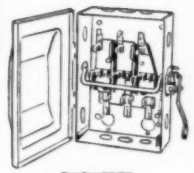
Bul. 4102
Safety Switch
Dust-Tight Safety Switch



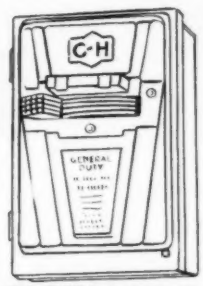
Bul. 4104
Safety Switch
Single Throw Explosion Proof Safety Switch



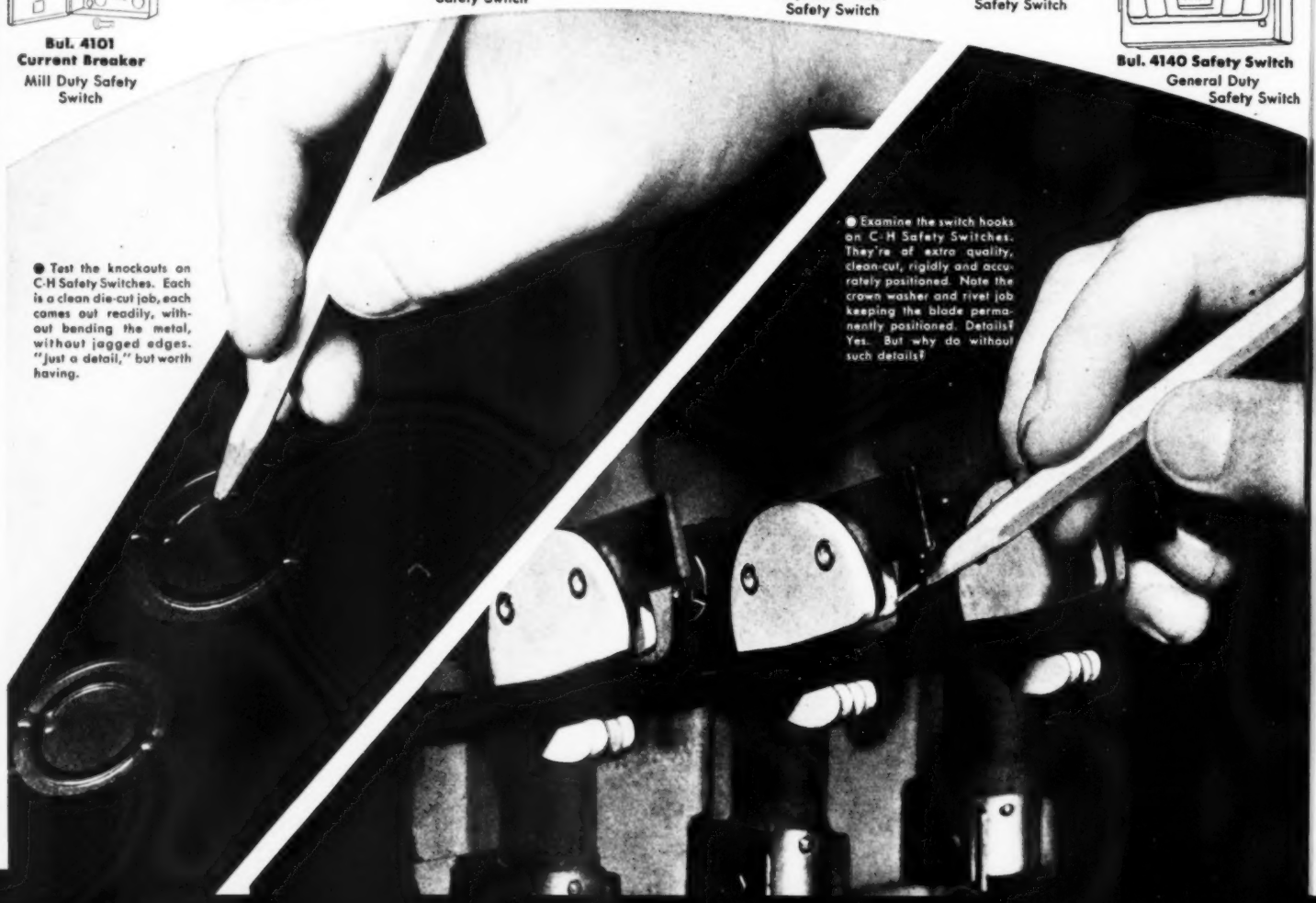
Bul. 4124
Safety Switch
Double Throw Explosion Proof Safety Switch



Bul. 4131
Safety Switch
Standard Duty Safety Switch



Bul. 4140 Safety Switch
General Duty Safety Switch



● Test the knockouts on C-H Safety Switches. Each is a clean die-cut job, each comes out readily, without bending the metal, without jagged edges. "Just a detail," but worth having.

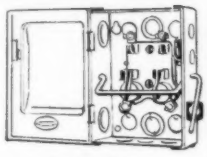
● Examine the switch hooks on C-H Safety Switches. They're of extra quality, clean-cut, rigidly and accurately positioned. Note the crown washer and rivet job keeping the blade permanently positioned. Details? Yes. But why do without such details?

UMI

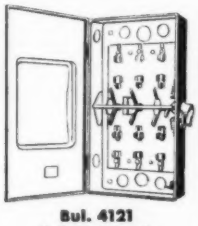


● Notice the corners of C-H Safety Switch boxes — true and tight; no warping or binding; no wrenching or slamming needed to open and shut. Another big little detail.

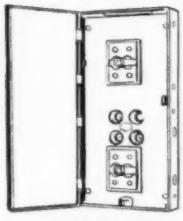
● Scrape a penny across a C-H Safety Switch, and discover a surface that doesn't scratch or flake. This finish can be applied only to No. 1 grade steel. "A detail," but important.



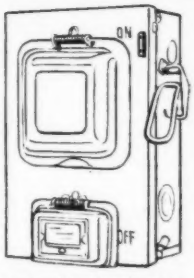
Bul. 4141
Safety Switch
General Duty
Safety Switch



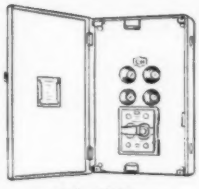
Bul. 4121
Safety Switch
Double Throw
Industrial Duty
Safety Switch



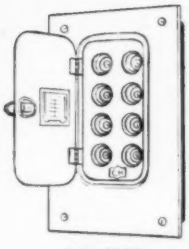
Bul. 4334
Range Switch
Combination
Main Switch, Range
and Lighting Circuits



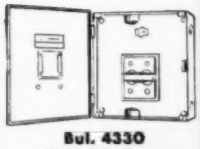
Meter Service Switch
Branch Circuit Type



Bul. 4354
Fuse Panels
Combination
Range Switch and
Lighting Circuits



Bul. 4355
Fuse Panels
Flush and Surface
Mounting Types



Bul. 4330
Pull Out Type
Entrance Switch

What Do You Want? A Complete Line? Sales Features? Quality? Acceptance? C-H Has It!

Completeness and thorough-going quality, mark the C-H Safety Switch Line. Every desired switch is offered. And every detail of every switch is engineered with the intelligence and engineering skill expected of the Motor Control Leader... Safety Switch quality is the sum of its perfected details—every detail contributes to the total result—the most nearly perfect switch is the one with the most nearly perfect details. Examine C-H Safety Switches in detail, and decide for yourself.... CUTLER-HAMMER, Inc., *Pioneer Manufacturers of Electric Control Apparatus*, 1306 St. Paul Avenue, Milwaukee, Wisconsin.

CUTLER C-H HAMMER

SAFETY SWITCHES

UMI

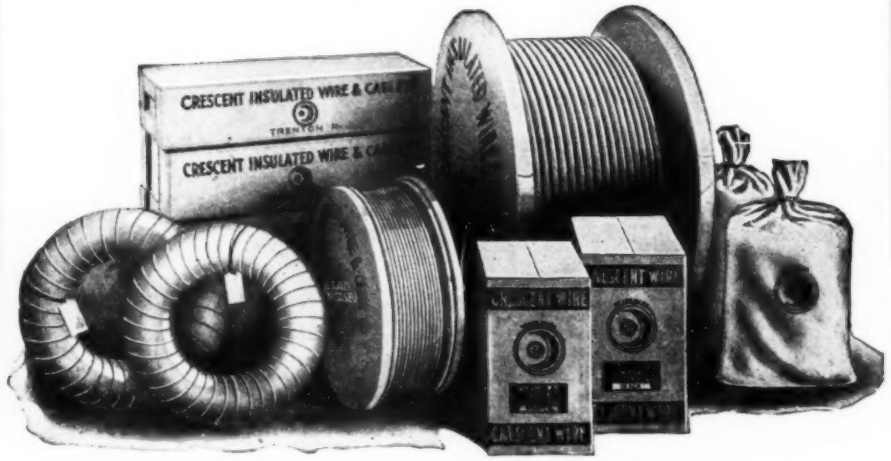
GEORGE WASHINGTON BRIDGE ✦ INLAND TERMINAL BUILDING, NEW YORK

RIKER'S ISLAND PENITENTIARY ✦ CHICAGO POST OFFICE ✦ PENNSYLVANIA RAILROAD STATION, PHILADELPHIA

✦ ATLANTIC CITY AUDITORIUM ✦ ✦ HOTEL NEW YORKER, NEW YORK ✦ ✦ WHITE HOUSE, WASHINGTON

CRESCENT WIRE SERVES THE NATION

Stocks carried in principal cities enable CONTRACTORS everywhere to realize the prestige and profit that results from the installation of wire and cable that is built not only for the need of the moment, but to insure the user's confidence, repeat business, and a more lasting business stability.



BUILDING WIRE	SIGNAL CABLES	FLEXIBLE CORDS
POWER CABLES	PARKWAY CABLES	WEATHERPROOF WIRE
CONTROL CABLES	ARMORED CABLE	MAGNET WIRE
LEAD COVERED CABLES	RUBBER SHEATHED CORDS	FLEXIBLE STEEL CONDUIT
VARNISHED CAMBRIC	NON-METALLIC SHEATHED CABLE	

SPECIAL CABLES TO MEET ANY SPECIFICATIONS

CRESCENT INSULATED WIRE & CABLE CO. INC.
TRENTON, NEW JERSEY.
46 YEARS OF KNOWING HOW

DEPARTMENT OF AGRICULTURE, EXTENSIBLE BUILDING, WASHINGTON, D. C.



FUSES MADE TO protect ...NOT TO BLOW

YOUR SPRINKLER HEADS DON'T OPEN NEEDLESSLY-WHY SHOULD YOUR FUSES



Copyright, 1935
BUSSMANN MFG. CO., St. Louis, Mo.
A Division of McGraw Electric Company

(PROOF AVAILABLE)

UMI



TAPE

IT STICKS
IT HOLDS
IT LASTS



BOSTON
WOVEN HOSE
and
RUBBER CO.

CAMBRIDGE, MASS.

No "Rip Van Winkles" When Your Customers use SANGAMO

TIME-SWITCHES





Your customers want no sleeping "Rip Van Winkles" to control their intermittent services. They demand absolute dependability and accuracy — not for just a day or a week — but indefinitely into the future.

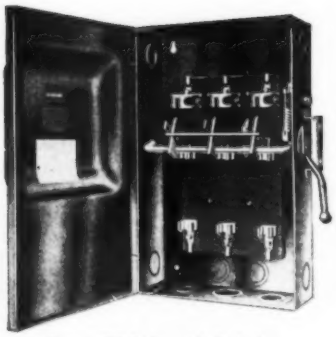
To meet this demand, use Sangamo Time-Switches. They are built by an organization to whom precision manufacture is a habit — an organization with 30 years of experience manufacturing fine instruments.

Order Sangamos from your jobber.

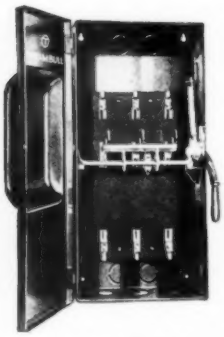
SANGAMO ELECTRIC COMPANY • SPRINGFIELD, ILLINOIS

UMI

A PROGRAM FOR



Type "C" Industrial Switches



Type "A" Heavy Duty
Industrial Switches



Type "RB" Heavy Duty
Industrial Switches

CONGRATULATIONS, N.E.C.A.!

Trumbull extends heartiest congratulations to the members of the National Electrical Contractors Association, on their first Convention in three years.

A GENERAL ELECTRIC ORGANIZATION

THE

UMI

BETTER SELLING

1 SELL FOR SAFETY

Safe and efficient power and light control are paramount necessities in Industry today.

Safety in switches begins with the switch itself, which is out of sight, locked in a steel cabinet. It must do its work day in and day out without a failure. To meet this necessity, the switch must be so carefully designed and adjusted electrically, and so strong mechanically, that absolute insurance against arcing, loosening of screws, or breakdown of the mechanism is obtained, insuring perfect operation at all times.

For thirty-five years our engineers have been engaged in reasearch and experimental work, on switches of all kinds. Today, Trumbull Industrial Switches safeguard against damage to person and property, and pay a higher return on the investment by lowering to a minimum the maintenance and servicing costs.

2 SELL THE BEST

Companies are established, and reputations are made by selling services and equipment that give full value for every dollar spent.

Most electrical contractors agree that a large percentage of their clientele has a limited knowledge of the quality of the equipment they use. This places the burden directly on the contractor. The contractor who promotes and sells only quality equipment is building his business on a solid foundation. He seldom has a dissatisfied customer.

In the final analysis, better selling begins with better materials and a proper knowledge of their application.

TRUMBULL ELECTRIC MFG. CO.

PLAINVILLE CONNECTICUT

UMI

3 CONDUITS THAT *Lead*

ENAMELKOTE

● A Conduit that bends easily—the enameling, inside and out, takes the bend without checking, flaking or cracking. Standardize on ENAMELKOTE—your customers will like it.

GALVAKOTE

● A slick inside finish permits wires to slip easily —no fussing—no lost time—stays smooth after bending too. A quality pipe with a quality galvanized finish that gets jobs through on time.

ELECTRICTUBE

● A thin wall conduit that provides adequate electrical and mechanical protection. Resists corrosion, easy to handle, no threading, electrically welded and bends easily without kinks.

Write us for data on this complete line of quality conduit and how you can cash-in on more profits.

CLAYTON MARK & CO.
Opera Building
CHICAGO ILLINOIS

UMI



Make Every Job Profitable
WITH GREENLEE TOOLS

GREENLEE Tools are profit makers on all jobs where conduit is to be bent, knockouts enlarged, holes bored for any purpose, or pipe pushed through the ground. The reason is that they do these jobs better and with a great saving in time. In many cases certain of these tools have actually more than paid for themselves on the first job.

Take the Hydraulic Conduit Benders as an example. They make better bends in less time than by any other method. They eliminate the use of many costly fittings and make it easy to pull in wire and cable. And when it comes to enlarging knockouts for conduit, there is no better way of saving time and making accurate, smooth holes than by using Greenlee Knockout Punches and Cutters.

If you are not already one of the many users of Greenlee Tools, it will pay you to investigate at once and learn for yourself why Greenlee Tools are a real profitable investment for every Electrical Contractor. Ask for complete information. A coupon is provided below. No obligation, of course.

Above is shown a Greenlee No. 770 Rigid Conduit Bender in action. By pumping the handle, a shoe on the ram is forced against the conduit, which is held at two points by formed support castings. It is simple to operate and easy to take to the job. No. 770 bends all sizes from 1¼ to 3-inch. The larger bender No. 775, handles all sizes from 2½ to 4½-inch.

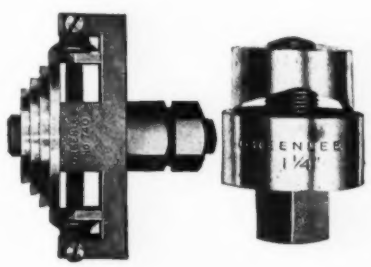


Above is a Greenlee No. 770-T Hydraulic Bender for thin-wall steel conduit. This machine is the solution to the problem of how to bend thin-wall conduit quickly and without crushing. The design is such that a full 90-degree bend can be made with one complete forward movement of the ram. Will handle 1¼, 1½, and 2-inch sizes.



The Greenlee No. 790 Hydraulic Pipe Pusher has a capacity for 3-inch and smaller pipe. Easy for one man to operate. Will exert a maximum pressure of 40,000 pounds against the pipe clamp.

To the right are shown the Greenlee Knockout Tools. They enlarge holes in outlet boxes, switch cabinets, etc., quickly and accurately, without reaming or filing. The punches come in two sets. No. 735 is for ½, ¾, 1 and 1¼-inch conduit, while the No. 737 set will enlarge holes for 1½ and 2-inch conduit. The No. 740 Cutter will enlarge holes for 1½, 2, 2½ and 3-inch conduit.



GREENLEE TOOL CO., Rockford, Illinois

Other GREENLEE Tools for the Electrician

Joist Borers Bit Extensions
Electrician Bits

GREENLEE TOOL CO., ROCKFORD, ILL. Date.....

Please send information on the following: .....

.....

Name.....Address.....

City .....State.....

My Jobber is.....9-35

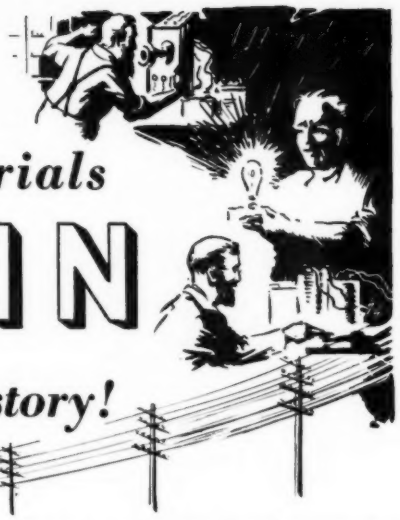
KING of ALL

electrical insulation materials

PORCELAIN

for proof — Look at History!





No man in 1843, even Professor Morse himself who constructed the first insulated line in America in that year between Washington and Baltimore, could have possibly foreseen the modern development of electrical insulation. Nor could any man vision the seemingly insurmountable problems of high voltage insulation which were later to be solved by that king of all insulation materials . . . PORCELAIN.

However, the unequaled insulation qualities of PORCELAIN began to be recognized as early as 1860 when porcelain is known to have been manufactured by the Southern Porcelain Co. at Kaolin, South Carolina.

Then in 1882 Deprez transmitted power over an insulated line thus foreshadowing the real development of porcelain insulators which began in 1900. With the turn of the century, Porcelain began to play its historic role in the development of generation, transmission, control and application of electricity. No other material then available or later developed had all of the insulation qualities required for the development of electricity as the servant of mankind. Porcelain literally changed the course of world history . . . for without it the development of electricity as we know it today would have been impossible!

Today, because Porcelain's electrical insulation qualities have never been duplicated, because it is the safest—the only everlasting electrical insulation, impervious to acid, rust and deterioration the foremost electrical engineers still recognize Porcelain as the king of all insulation material. Today the first Porcelain used for insulation is still in service!

Knobs and tubes and other porcelain wiring materials cannot be overlooked by the alert electrical contractor and dealer. This construction is still the biggest profit material. It increases labor profits. It cuts material costs because Porcelain costs far less than other types of insulation.

Approved by National Electrical Code

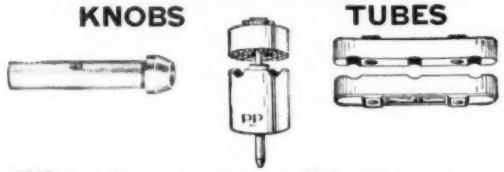
Yet Porcelain knob and tube construction meets all of the requirements for the installation of non-metallic wiring systems where water piping systems are not available for ground electrodes as recommended in Article 5 of the 1935 National Electric Code. The use of Porcelain knob and tube construction and non-conducting boxes and covers in these installations practically eliminates the hazards of accidental shock. This type of construction can be used for every electrical insulation requirement except where building construction necessitates a raceway.

Porcelain knobs and tubes enable you to meet the demand for more electrical outlets for with this type of construction you can offer the buyer MORE OUTLETS for an EQUAL AMOUNT OF MONEY. That means MORE BUSINESS, MORE PROFITS and MORE WAGES for the electrical industry. Start putting porcelain to work increasing your business and profits. Start today.

Wherever possible use

PORCELAIN

KNOBS **TUBES**



This important Message to the Electrical Industry is Sponsored by

USE

Illinois Electric Porcelain Co.
Macomb, Illinois
Superior Porcelain Company
Parkersburg, W. Va.
Universal Clay Products Company
Sandusky, Ohio
Knox Porcelain Corporation
Knoxville, Tenn.

Porcelain Safety Economy Permanence

Porcelain Products, Inc.
Parkersburg, W. Va.
Central Porcelain Company
Columbiana, Ohio
Ceramic Specialties Co.
East Liverpool, Ohio

See our representative at the Annual Section Meetings, International Association of Electrical Inspectors.

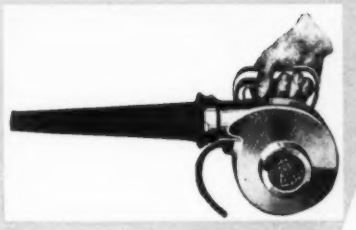
For Further Information Write

STANDARD ELECTRICAL

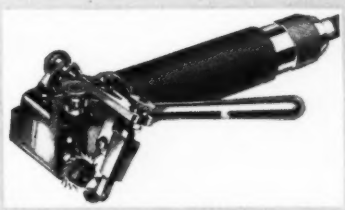
Room 734, 201 North Wells St., Chicago, Ill.

PORCELAIN MANUFACTURERS

HEADQUARTERS
FOR MOTOR AND MAINTENANCE EQUIPMENT



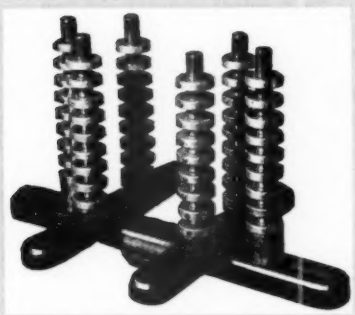
IDEAL ELECTRIC CLEANERS. Powerful low-pressure cleaners that vacuum, blow, spray. 6 Models meet every requirement.



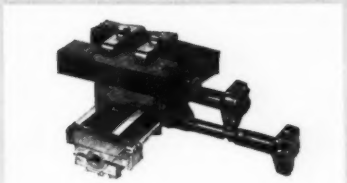
IDEAL MICA UNDERCUTTER. Universal for shop or field use—large or small Commutators.



IDEAL TEL-TEMP INDUSTRIAL THERMOMETER indicates motor and machinery temperatures.



IDEAL COIL WINDING HEAD. Works at high speed, has low first-cost, pays for itself in short order.



IDEAL PRECISION GRINDERS. Commutators and Rings trued in their own bearings at normal operating speeds. 4 Models.





IDEAL COMMUTATOR AND SLIP RING RESURFACERS. 175 styles and sizes, five grades of abrasives from "Extra Coarse" to "Polish" for very fine burnishing.

IDEAL
offers these cost-cutting suggestions that save time and make money

The Ideal Commutator Dresser Company specializes in motor maintenance equipment and electrical supplies. It's products afford many outstanding advantages—all of which can be definitely proven to you.

IDEAL COIL WINDING HEAD. Does a better and much faster job than can be done on "home-made" equipment; adjustable—eliminates necessity for a wide variety of jigs and forms of various sizes. Winds an entire phase group from a single wire. Makes field, mush, armature, transformer, motor coils and loops with diamond, round, square or rectangular cores. Coil making time is materially reduced and unit pays for itself on a few jobs.

IDEAL PRECISION GRINDERS. Bring the tool to the work. It gives a more perfect job because it trues Commutators and Slip Rings in their own bearings under operating speeds. Used as standard by leading motor repair shops.

IDEAL TEL-TEMP. Something new, economical and efficient in Industrial Thermometers. Attaches to open and closed motors—other machinery too. "Avoids trouble by looking for it."

IDEAL MICA UNDERCUTTERS. Especially adapted for the motor repair shop. Extraordinarily practical for use on large and small Commutators either in the shop or in the field. Powerful—compact—easily operated.

IDEAL STEEL SAWS — CUTTERS. Don't buy your requirements until you have seen, tested or otherwise investigated thoroughly these *long-life* Ideal Commutator Saws and Cutters.

IDEAL ELECTRIC CLEANERS. You know where the dusty motor and machines are and who should have an Ideal Cleaner. Sell them to your customers.

IDEAL COMMUTATOR AND SLIP RING RESURFACERS. Made from a special formula. Noted for uniformity and long life. There is an Ideal Resurfacer for every truing job.

The active season is just ahead! Be prepared! Get organized for real business now! Use coupon for special information on these cost-cutting, money-making Ideal Products!

NEW CATALOG UPON REQUEST

IDEAL COMMUTATOR DRESSER CO.

1041 PARK AVENUE
SYCAMORE, ILL.

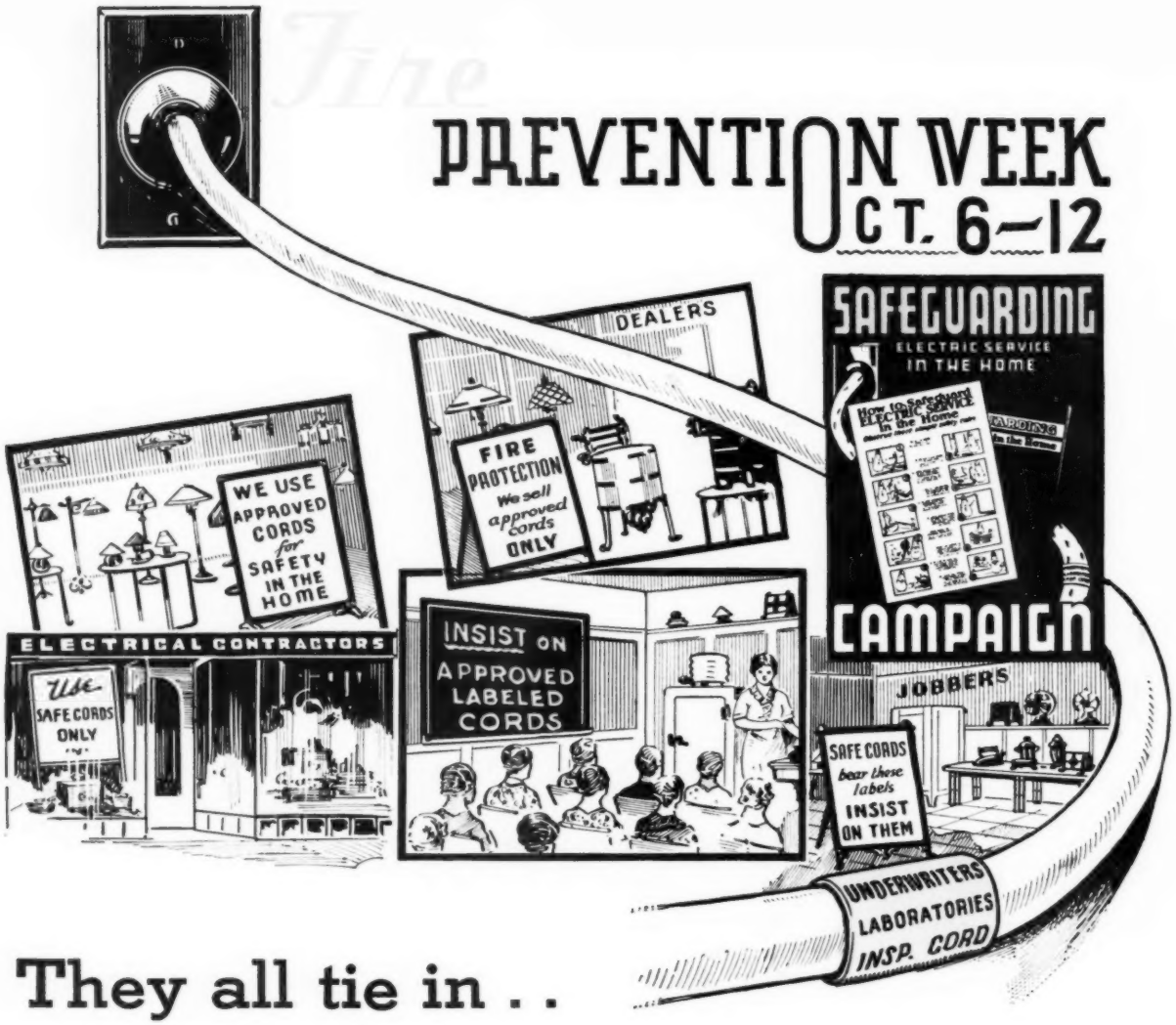
Ideal Commutator Dresser Company
Sycamore, Illinois.

Gentlemen: I am interested in the tools checked here Please send me further information and prices.

( ) IDEAL COIL WINDING HEAD
( ) IDEAL PRECISION GRINDERS
( ) IDEAL MICA UNDERCUTTERS
( ) IDEAL CUTTERS
( ) IDEAL CLEANERS
( ) IDEAL TEL-TEMP
( ) IDEAL RESURFACERS
( ) IDEAL CATALOG

Name .....
Firm .....
Street .....
City ..... State EC935

UMI



They all tie in . .

This year the electrical industry is to profit from fire prevention activities during the week of October 6th . . . directly and indirectly.

There is indirect profit to all in safeguarding electric service in the home.

There is direct profit from timely, visible tie-in with this great nation-wide movement.

It will give a lift to the business accruing from the public education being carried on by the "Safeguarding Electric Service In The Home" campaign . . . now blanketing the nation with lectures, exhibits, displays. Around this movement, based on the need for approved, labeled cord and other devices the whole "Safety in Wiring" program revolves. They are intertwined.

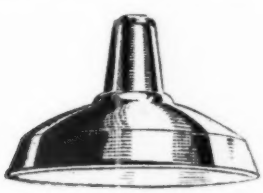
If you have not yet participated—get in touch with your local inspection bureau. They will advise you of how you can make the most of a movement directly affecting your business. If you are demanding APPROVED LABELED CORD and approved materials, you have the basis for cooperation.



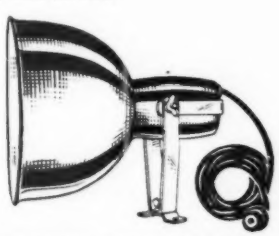
BETTER LIGHT FOR BETTER SIGHT

SIGHT-CRAFT UNITS ARE DESIGNED FOR HIGHER INTENSITIES

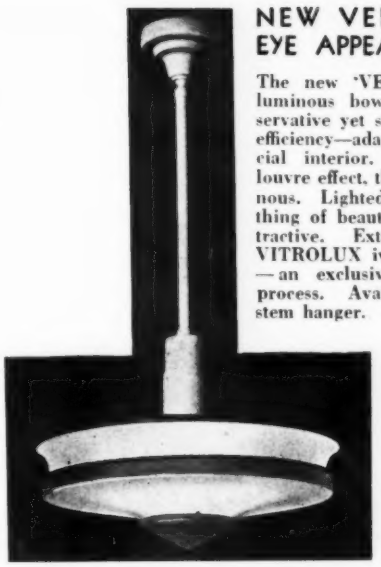
Smoot-Holman engineers are attuned to the trend toward higher intensities as the modern requirement for better vision. These concepts of scientifically correct lighting units are rapidly increasing in popularity because of price, efficiency and attractiveness. They are but a few of the commercial and industrial units made in a great plant in the West under the supervision of men with long experience in the lighting field.



INDUSTRIAL UNITS OF EVERLASTING VITROLUX FINISH . . . Durability and low cost are again evident in these scientifically correct reflector units, thousands of which are proving their worth in many industries. Especially constructed to withstand severe atmospheric conditions. Sight-Craft lighting units invite comparison in price, quality and service.



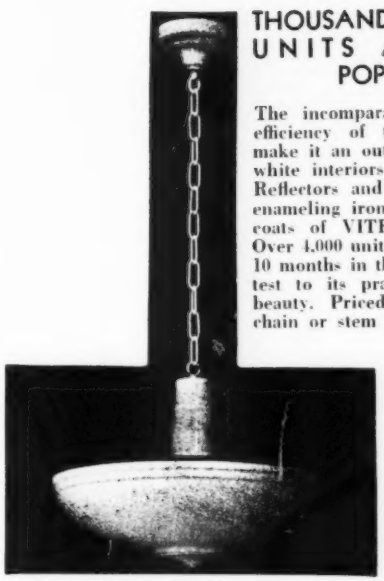
UTILITY REFLECTOR FOR GARDENS, INDUSTRIAL YARDS, GARAGES . . . Here is the answer to the many calls for a good reflector for general floodlighting. This 200-watt unit is priced at only $3.60 List—including 4-ft. of all-rubber cord and sturdy plug. Triple fired porcelain finish, sturdy construction throughout. Cat. No. 2010. A volume item.



NEW VENUS HIGH IN EYE APPEAL — EFFICIENCY

The new 'VENUS' is a beautiful luminous bowl LUMINAIRE—conservative yet startling in design and efficiency—adaptable to any commercial interior. Through a special louvre effect, the bowl is made luminous. Lighted or unlighted it is a thing of beauty. Priced equally attractive. Exterior is of famous VITROLUX ivory everlasting finish —an exclusive SMOOT-HOLMAN process. Available with chain or stem hanger.

SIGHT-CRAFT VENUS LUMINAIRE



THOUSANDS OF 'APOLLO' UNITS ATTEST TO POPULARITY

The incomparable appearance and efficiency of this 'APOLLO' unit make it an outstanding value. Has white interiors and ivory exteriors. Reflectors and hoods are of finest enameling iron on which is fired 3 coats of VITROLUX at 1600° F. Over 4,000 units sold within the first 10 months in the western market attest to its practical efficiency and beauty. Priced low. Available with chain or stem hanger.

SIGHT-CRAFT APOLLO LUMINAIRE

SIGHT-CRAFT UNITS QUICKLY INVITE NEW AND REPEAT BUSINESS

Send at once for complete catalog and price list. Use coupon below or send post card or letter.

SMOOT-HOLMAN COMPANY

SMOOT HOLMAN COMPANY
SIGHT-CRAFT
INGLEWOOD CALIFORNIA
MADE IN U.S.A.

INGLEWOOD, CALIFORNIA

SAN FRANCISCO • NEW YORK

SEND US A COMPLETE CATALOG OF SIGHT-CRAFT LIGHTING UNITS

NAME .....

COMPANY .....

CITY ..... STATE .....

UMI

THIS IMPROVED PRODUCT

Everdur Electrical Conduit

MEANS NEW BUSINESS FOR YOU

SINCE its introduction a short time ago, Everdur Electrical Conduit has been experimented with and extensively used by leading meat packers, salt refiners, chemical works, miscellaneous manufacturers, electrical companies, governmental units, and others. And for these good reasons:

Everdur Electrical Conduit meets the long felt need for a completely rust-proof electrical conduit at moderate cost. It is . . .

DURABLE AND STRONG
HIGHLY RESISTANT TO CORROSION
NON-MAGNETIC
EASY TO INSTALL AND TO DISMANTLE
SOLD BY RECOGNIZED DISTRIBUTORS

This new Anaconda product has been listed and labeled by Underwriters' Laboratories and is available in 2 wall thicknesses—"EMT" and Rigid Conduit. Of uniform temper and accurately drawn to size for assembly with threaded or threadless Everdur fittings, it can be cut, threaded, bent and assembled in practically the same manner and with the same equipment employed for steel conduit or tubing.

Everdur Electrical Conduit is recommended for installations exposed to general corrosive conditions or hazardous locations, and where ultimate cost and maximum safety are of primary consideration. It is an improved product in every sense of the word. It offers you an opportunity to get new business now. Our *new* Anaconda Publication E-12, and a sample length of Everdur Electrical Conduit, mailed on request.

35148

THE AMERICAN BRASS COMPANY
Buffalo Branch: Buffalo, N. Y.
Offices and Agencies in Principal Cities



ANACONDA
from mine to consumer
REG. U.S. PAT. OFF.

EVERDUR METAL
"EVERDUR" is a registered trade-mark, identifying products of The American Brass Company made from alloys of copper, silicon and other elements.

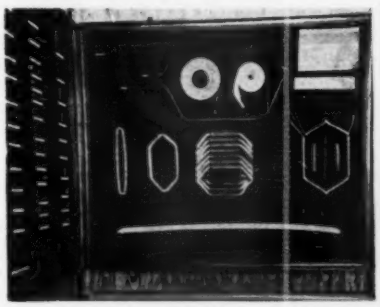
ANACONDA COPPER & BRASS

UMI

Service Shop . . . Practice . . . . . .

Display Rack for Shop Methods

Because customers do not all realize the important operations that are necessary to lasting motor rewinding jobs, the Electrical Maintenance and Engineering Works, Woonsocket,



R. I., has provided a neat display board near its service counter. Here a customer may quickly see several stages of coil-making, taping and impregnation. A flattened model stator section shows how coils are insulated and wedged into place. Samples of insulating materials and wire used in motor work are included also. A neat display board, covered with green burlap, and having varnished molding borders has been built for this display.

Customer Charged for Abrasives

The work involved in grinding down the commutators of large generators and motors out on the job usually consumes a considerable amount of abrasive surface. To handle the charges for this type of work equitably, the Electric Motor Repair Company, Inc., Waterbury, Conn., charges for the number of cubic inches wear-off which takes place in doing the job. The various commutator dressing or grinding blocks are measured when sent out and upon their return to the shop, and these before and after measurements constitute a basis for charging the loss that has occurred. A manufactured precision grinder outfit is owned by this company for use on such jobs. This equipment has to a great extent done away with the need of bringing large armatures to the shop for lathe commutator turning.

Out-of-the-Way Motor Terminal Cable Rack

The final connections for various sizes of motors require different sizes and types of wire in short lengths. The amount of material needed is



small in comparison with the labor cost involved in handling odd spools of wire for each job. An overhead spool rack was placed near the ceiling above the wooden turn-table in the shop of Geo. M. Jones, Scranton, Pa. When a motor has been placed upon this connecting turn-table, the required wire size is within easy reach of the mechanic without unnecessary steps, and without the spools being in the way. It is also more convenient to cut off the wire exactly as needed for each connection without wasted material.

Identified Repair Labels

The pioneer firm of H. H. Roth, Wilkes Barre, Pa., has built up several types of service and repair work which must be kept separate for quick identification. Shop tags were therefore printed in four distinct colors to identify electrical, lawnmower, keys and general repair orders. When a customer sends a messenger or a child for a repaired item, the colored claim stub which was originally torn from the shop tag immediately identifies the class of work being called for without the clerk's first having to inquire as to the kind of work involved.

Motor Test Lead Cabinet

Industrial plant tests, such as motor efficiency, power factor, feeder overloads, voltage fluctuation, etc., require the Berks Engineering Com-



pany of Reading, Pa., to keep on hand a wide selection of instrument test leads of various current carrying capacities. To prevent these leads becoming tangled up or damaged around the repair shop, a separate storage cabinet has been provided for them. A sliding door on this cabinet is stenciled with the well-known admonition, "Please Keep All Material in Its Proper Place."

Time-Saving Tests for D.C. Motors

The numerous occasions when short running tests are required for d.c. motors, which are brought in without their starters, caused the Roland Electrical Company, Baltimore, Md., to build a test board which would permit the quick hook-

UMI

THE WIREMOLD ZONE

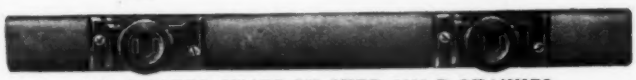
THERE IS A WIREMOLD ZONE OF USEFULNESS AND PROFIT IN EVERY FIELD OF WIRING PRACTICE!

NUMBER 10 OF A SERIES ON WIRING OPPORTUNITIES

For Instance—

The Wiremold Plan for CONTINUOUS OUTLETS

1127 1127



1100-C COVER SNAPS ON OVER 1100-B CHANNEL

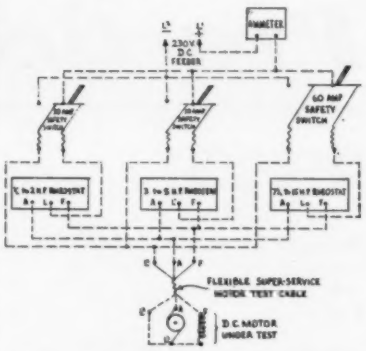
Add outlets when you need them. Place them where you want them. Cut capping (1100-C) to fit spaces between them. Same method used to install WIREMOLD socket receptacles for work benches, laboratories, etc., etc.

10-POINT *Superiority!*

1. Lighting Strip and Fittings are available everywhere—all jobbers carry them.
2. Contractors understand how to install it.
3. Provides practically unlimited number of outlets—placed either next to each other or at any desired distance apart.
4. Capacity, nine wires—with plenty of room to spare.
5. Listed by Underwriters' Laboratories, Inc. (under "Fixture Fittings").
6. Assembled and wired by electrical wiremen on the job (or may be assembled in shop and taken to job).
7. Less expensive than less satisfactory systems heretofore in use.
8. Standard! Suitable for use with materials, fittings and appliances already accepted and approved.
9. Part of a known and recognized wiring system—i.e. WIREMOLD!
10. It is, in itself, its own best selling argument—because it gives the contractor something to show the customer which is sure to please him—AND SAVE HIM MONEY.

THE WIREMOLD COMPANY, Hartford, Conn.

up and running test of such motors. Separate rheostats and safety line switches were installed in a group as follows: One switch and rheostat for starting ½ to 2-h.p. motors; another for 3 to 5-h.p. motors, and a third assembly for 7½ to 15 h.p. motors. A



common feeder with an indicating ammeter in series was connected to three line switches controlling their respective rheostats. The rheostats were connected in multiple to a 3-conductor portable cable that provides the motor circuit.

With this arrangement a d.c. motor from ½ to 15 h.p. may be readily given a quick preliminary running test by the simple attachment of the portable cable terminals and the closing of the line switch which controls the rheostat within the h.p. range of the motor that is being hooked up. No time is lost in finding suitable resistances or starting devices, nor in providing necessary temporary connections.

Adding Service to Iron Cords

Believing that anything worth doing at all is worth doing well, the Snyder Electric Company, Harrisburg, Pa., has acquired a reputation



for dependable appliance cord repairs. Everyone coming into this shop with cord trouble is shown how cords should have the asbestos insu-



All Electrical Equipment Placed on Power Circuits means Economy

Here is a real opportunity of creating business for yourself and saving your customer money.

If lamps or electrical devices are used at motored machines, connect a Jefferson air-cooled transformer to the "lower rate" higher voltage power line and 110 volt current will be delivered from the transformer for their operation.

Groups of circuits can be supplied with 110 volt current for lamps, soldering irons, drills, and small motor-driven devices or for remote control circuits.



Individual Compartments for Connections

Cover broken away to show primary leads in one compartment and the secondary leads in another—both completely covered when installed.

Jefferson Air-Cooled Transformers Will Save Money in Every Plant

In every plant there are opportunities to point out how savings can be made by connecting more of the lighting and small-devices load onto the higher voltage power circuits. The savings will pay for the transformers and your materials and installation costs.

Jefferson air-cooled transformers are listed as standard by Underwriters' Laboratories.

Get our latest pamphlet 341-PCT which gives all the information and data.

JEFFERSON ELECTRIC COMPANY

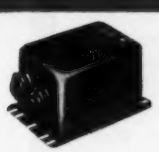
Bellwood (Suburb of Chicago) Illinois

Canadian Factory: 535 College St., Toronto

JEFFERSON TRANSFORMERS



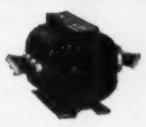
Jefferson Neon Tube Transformers are made for both indoor and outdoor signs.



Leading oil burner manufacturers insure operating performance with Jefferson Transformers.



For signal systems, relay systems, Jefferson's have long been known for their dependability.



In connection with control mechanisms, Jefferson Transformers are built to meet the most exacting requirements.



For decades Jefferson Door Bell Transformers have responded to the touch of millions of fingers.

UMI

Attention—Contractors

Your opportunity to purchase lead covered cable at attractive prices to enable you to secure rehabilitation work — also lighting of Football and Athletic Fields. We installed and have now pulled out the 600 volt rubber insulated lead covered cable used for the underground distribution system at A Century of Progress, Chicago, during 1933 and 1934.

We have retained only that cable which is in first class condition and offer as follows:

Size		Quantity	Maximum Length	Price Per M ft
500,000	1/C	1200′	156′	319.20
400,000	1/C	7500′	411′	273.60
300,000	1/C	1600′	149′	228.00
250,000	1/C	1300′	245′	204.00
4/0	1/C	78000′	447′	156.60
2/0	1/C	6900′	185′	115.80
2	1/C	2400′	287′	66.60
6	1/C	1800′	245′	46.20
4/0	3/C	234′	179′	534.00

Prices are F.O.B. Chicago

This cable has been carefully tested and inspected and will function the same as new cable.

All orders accepted subject to prior sale

Wire or mail your orders to

KELSO-BURNETT ELECTRIC CO.
ELECTRICAL CONTRACTORS
223 W. Jackson Blvd., Chicago, Ill.



Do you Realize the Definite Relationship Between Moisture and Brush Operation?



HUMIDITY AND ITS EFFECT ON BRUSHES IS AN INTERESTING STORY . . . . .

This subject is treated as broadly as possible in "The Brush Phase of Motor Maintenance."

It is available without charge ...no strings attached and if the knowledge obtained improves the efficiency of your equipment, we will be more than satisfied. *Send coupon today for your copy.*

THE OHIO CARBON CO.
12508 Berea Road Cleveland, O.

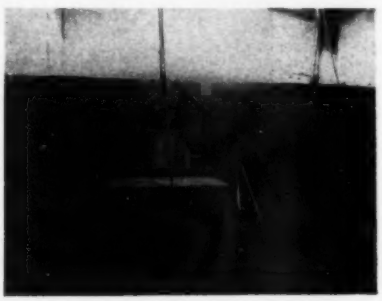
THE OHIO CARBON COMPANY
12508 Berea Road, Cleveland, Ohio
Please send free copy of booklet "The Brush Phase of Motor Maintenance."

Name_____
Company_____
Address_____

lation closely wrapped with strong thread from the edge of the outer common covering to the terminal binding screws. This is explained as preventing possible sputtering shorts, and loose strands breaking away to lessen the cord's current carrying capacity. Although the highest grade cords are featured by this firm, they always repair less durable cords for customers in the same manner, as a good will feature of this company's service.

Coil Dipping Room

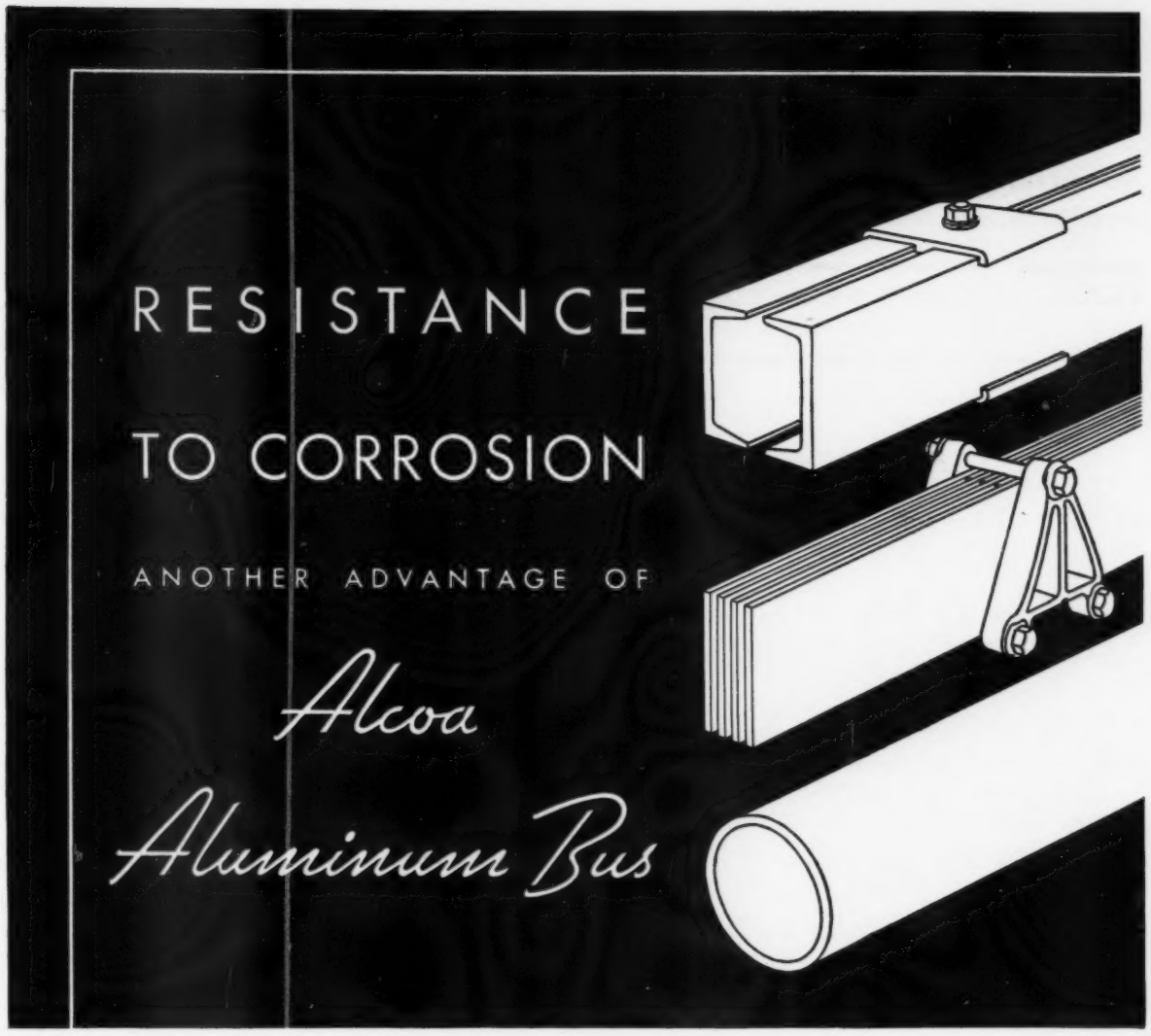
The manufacture of heavy coils for special motors in street railway and mining service caused the Berks Engineering Company, Reading, Pa., to design a separate dipping room



for this operation. Two dipping vats were provided, each with an inclining sheet steel drip pan extending upward to the rear wall. Sets or groups of coils are hung upon crossbars and lowered into the dip with overhead hand hoists. After immersion these coils are raised and the hoist is rolled toward the back wall. They are lowered until the crossbars rest in the notches of opposite steel supporting rails which are provided alongside the drip pans. After the coils have been drained of all surplus, they are ready to be transferred to truck-type, bake-oven racks.

Temporary Motor Storage

The Penn Electrical Engineering Company, Wilkes Barre, Pa., purchased several carloads of used motors in addition to its regular stock and needed to house them in a limited floor space in order to avoid warehousing expense. Since these motors were limited to several large sizes of similar frame construction, it was possible to arrange them upon the floor in rows, and three decks high, by using 2-in. by 12-in. timbers between decks. This temporary method of stocking permitted a saving in space and avoided the cost of building heavy motor storage racks.



Nature made Aluminum highly resistant to the corrosive attacks of some of the most destructive fumes in industry.

That is why Alcoa Aluminum Bus gets the call for plating tank installations, locations that are exposed to sulfurous fumes, and similar tough spots.

In these, and in all other applications, you get the advantage of the 52% weight saving of Aluminum Bus. Actual costs of erection are lower because Aluminum is easy to work and light to handle. Bolted joints or welded joints are equally feasible.

Three forms are available: Channeluminum, the rolled channel section for very high current loads, combines highest electrical and thermal efficiency with great mechanical strength; Flat Bus and Tubular Bus, as good engineering may dictate.

For all these forms, fittings are simple and economical. The low per-foot cost is the final reason for specifying Alcoa Aluminum Bus. For full details write ALUMINUM COMPANY OF AMERICA, 1897 Gulf Building, Pittsburgh, Pa.

ALCOA · ALUMINUM

UMI

Code Chats . . . . .

Questions and answers relating to the interpretation of the National Electrical Code . . .

Conducted by F. N. M. Squires

Chief Inspector New York Board of Fire Underwriters

Decorative Lighting

Does the rule of twelve outlets per circuit, 15 amp. fuse, apply in connection with decorative lighting where for instance it is decided to provide forty 10- or 25-watt lamps?

Decorative lighting is generally classed with outline lighting and the outlet or circuit limitation of 3806-g is generally applied rather than the limitation of twelve outlets of rule 2005.

Motor Group Protection

Would five 3/4 h.p. 3-phase 220-volt a.c. motors be permitted on one No. 12 circuit at a distance of 40 ft. protected by 20-amp. fuses at mains and 10-amp. fuses at each motor switch?

Yes, this arrangement is permissible under the Code rules, but the word "circuit" in the question should be feeder.

The rating for a 3/4 h.p. 3-phase 220-volt motor is 2.8 amp., applying rule 808-a-1,

2.8 x 125% = 3.5 amp.
2.8 x 4 = 11.2 amp.

14.8 amp. required for the feeder so that a No. 12 wire is acceptable.

For the feeder protective device,
2.8 amps x 250% (Table 6) = 8 amp.
2.8 amps x 4 = 11.2 amp.

19.2 amp. for which the 20-amp. fuse is the nearest standard size.

Use of Neon Sign Cable Outdoors

Can ordinary Neon sign cable be used out in weather?

Approved gas tube sign cable may be used out-of-doors when installed in compliance with rule 3808-c which requires that the cable be either enclosed in conduit or on approved insulators which will separate the cable at least 2 in. from other objects.

When within reach from ground, roof, or window, they shall be installed in conduit.

Service Entrance Cable

What about this new SE cable being used for combination light and power services, including ranges?

The initials SE stand for Service Entrance cable.

The rules governing its use appear in Sections 403 and 404 of the Code. There are four types of this cable, SE, ASE, CSE and USE.

The type SE cable is for use above ground where not subject to mechanical injury. Where subject to mechanical injury it is to be protected by conduit.

Type ASE may be used where subject to mechanical abuse and does not require the conduit for protection.

Type CSE, does not have in itself protection against mechanical abuse, nor a flame retarding, moisture resisting covering. It is only for use in rigid conduit or electric metallic tubing.

Type USE is for underground use only.

The above cables for service entrance use may have one wire which is not insulated and which is to be used as the grounded conductor. This is commonly called the bare neutral.

Type ASE but with all wires insulated, that is, not of the bare neutral type, may be used for interior wiring.

The 1935 Code (After Nov. 1, 1935) will permit the use of ASE cable for interior circuit wiring provided all conductors including the neutral wire have approved rubber insulation.

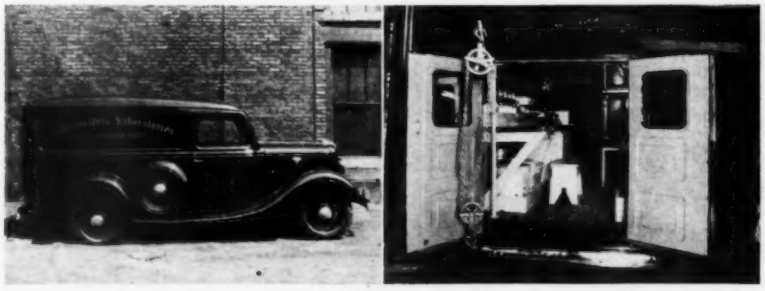
The 1935 Code will further permit the use of the bare neutral type of ASE cable for electric ranges only (but not including water heaters) providing the cable has a non-metallic outer covering and is used only on an a.c. system having not over 150 volts to ground and at least one ground on the secondary system in addition to the ground at the service.

Transformers in Buildings

Are transformers permitted within buildings where it is desired to take 110 volts off of 3-phase 220-volt systems?

In the above set up an auto transformer would not be permitted under rule 2001-b. Other transformers, however, are permitted under Section 1102.

Oil filled transformers of 7½ kva or less, and air-cooled transformers of the voltage mentioned, need not have



APPROVAL TESTING AT THE DOOR: One of the traveling laboratories which were fitted out by Underwriters' Laboratories and placed in service on July 29, 1935, to acquaint jobbers and contractors as well as electrical inspection authorities, with the inspection and test work regularly undertaken by the inspectors of Underwriters' Laboratories at the factories of manufacturers subscribing to the label service. The equipment of the field laboratory is such that it is possible to duplicate factory tests on rubber-covered wires and cords, rigid conduit, armored cable, flexible non-metallic tubing, etc. Each laboratory will be in charge of an experienced inspector who will visit electrical jobbers, contractors, and retailers of electrical supplies to obtain representative samples of labeled products. The samples will be tested on or near the dealers' premises, and the results reported to the manufacturers of the labeled goods.

Install the BULLETIN 709
SOLENOID STARTER





● It's hard to believe that you can install an automatic motor starter and FORGET IT—but with the Bulletin 709 Starter you can do just that!

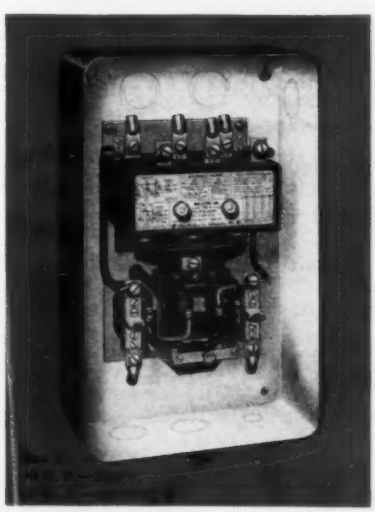
● The secret lies in the patented silver alloy used in the double-break contacts and in the solenoid design of the starter mechanism. The silver-alloy contacts should never be dressed—they require no attention. The low drop-out voltage of the solenoid permits continuous operation even when line voltages fluctuate. There is no contact rebound in the Bulletin 709 — thus welding and excessive contact burning have been eliminated.

● White cabinet interiors reflect light and facilitate wiring in dark places. There is generous room for wiring. All connections are accessible from the front. No slate or molded panels are used. Twelve knockouts are provided on back and sides. With this starter it is easy for anyone to make a neat and clean looking job.

NO MORE CONTACT DRESSING!



BULLETIN 709—for every type of service



Bulletin 709 Starters are made in three sizes for motors up to 30 H. P., 220 volts and 50 H. P., 440-550 volts. Enclosing cabinets are available to cover every service—**general purpose, dust-tight, explosion-proof, water-tight, and corrosion-proof.** Bulletin 709 solenoid mechanisms are used in Allen-Bradley reversing switches, combination starters, multi-speed motor starters, etc. You ought to know more about this most up-to-the-minute line of control apparatus. Send for bulletin and prices today.

ALLEN-BRADLEY
AUTOMATIC SOLENOID STARTERS

1307 S. First Street Milwaukee, Wis.

UMI

GREETINGS...

MEMBERS OF N. E. C. A.!

Welcome

TO THE CONVENTION

May your visit be as profitable as it will be enjoyable

"U.S." with its line of friction tapes, splicing compounds, wires and cables extends its good wishes and takes opportunity to express its appreciation of your support.

"U. S." pledges you the finest products it is capable of producing and assures you of its wholehearted co-operation at all times.







Whatever your friction or rubber tape requirements may be you will find, within the "U.S." line, a product that exactly fits your needs. For quick, neat, permanent jobs "U. S." tapes have won an ever-growing following among electrical contractors.

Specify "U. S." when ordering tape, wire or cable through your jobber.

United States Rubber Products, Inc.
1790 Broadway New York City

United States Rubber Company

enclosures or vaults but oil-filled transformers of over 7½ kva must be installed in a transformer vault.

The lighting circuit must, of course, comply with the requirements of Section 2001 as well as other applicable rules.

Range and Water Heater Service Sizes

On page 34 of the June "Code Chats" there appears a question and answer under the sub-heading 'Range and Water Heater Service Sizes." I have been associated with Mr. Squires, as a fellow member of the Electrical Committee, N.F.P.A., for a number of years, have read his "Code Chats" in your magazine for an equal length of time and usually find his interpretations of the rules of the National Electrical Code to be accurate.

Mr. Squires' answer in this case, however, is so misleading that I am tempted to enquire if he is not applying Section 2011 in calculating feeder sizes in his work as chief inspector of the New York Board of Fire Underwriters.

If Mr. Squires, or his questioner, will apply sub-paragraph 4 of paragraph d, Section 2011, they will find that a No. 6 feeder, 3-wire, single-phase, 220/110-volt service, with loads properly balanced, is entirely adequate to supply a single family residence with floor area of 1,300 sq.ft. with a 9,000-watt range, 1,500-watt water heater and two or more lighting and/or appliance branch circuits.

In the case in question the actual connected load on the feeders, if both branch circuits are loaded to full capacity of 1,650 watts each, (15 amp., 100 volts) would be 13,800 watts, or 62.7 amp. at 220 volts with balanced load, and by applying a demand factor of 80 per cent to the range, as provided in sub-paragraph 18 of Section 2011-d, we reduce this value to 12,000 watts, or 54.5 amp. at 220 volts. But by applying the area demand rule of sub-paragraph 4 instead of the actual load on the branch circuits, for a floor area of 1,300 sq.ft. we obtain a value of 2,300 watts instead of 3,300 watts for lighting and appliance load and this will give a total estimated demand on the feeders of 11,000 watts, or exactly 50 amp. at 220 volts, with balanced load.

We are greatly indebted to C. S. Graham of Jacksonville, Fla., for his comments, but we do not know from where he obtained the 1,300 sq.ft. he uses in his computations. Our ques-



F-M Type QZC Enclosed Fan-Cooled Motor showing end shield removed. Note fan on shaft.

PROTECTED POWER *For Every Motor Drive*

F-M TOTALLY ENCLOSED SELF-VENTILATED MOTOR PROVIDES ITS OWN TWO-DIRECTION VENTILATION—SEALS OUT METAL DUST AND ABRASIVES

Many large users of machine tools have found in Fairbanks-Morse totally-enclosed fan-cooled motors that extra stamina and mechanical excellence which reduces servicing and lowers production costs.

Its own specially developed two-way ventilation system, including two non-clogging one-piece fans, and its cast-iron enclosing shields guarantees that the motor will not fail in the presence of dust, dirt, metallic particles, steam, moisture, abrasives or even corrosive gases or fumes in the air. Fairbanks-Morse welcomes the opportunity of cooperating with contractors and industrial maintenance specialists in selecting and applying the best suited motors for the service required.

Before you recommend or select a motor for any purpose, investigate the added protection and extra life Fairbanks-Morse motors offer. Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 32 branches at your service throughout the United States.

Pioneer Designers and Manufacturers of POWER, PUMPING AND WEIGHING EQUIPMENT 105 Years

FAIRBANKS-MORSE
MOTORS

0472—EA40.87

QUICK DETACHABLE

Reflectors



• Do you want a really profitable line of lighting units for your industrial lighting business? Then investigate the highly flexible, complete Quad Line, for indoor and outdoor lighting of all kinds.

Quad Reflectors are convenient, easily wired and installed, with a high lighting efficiency. Use them to help get business — sell modernization of industrial lighting with Quad Units. Quickly detachable for cleaning, etc., without disturbing wiring, strongly constructed and weather-proof.

Keep your customers satisfied; insure repeat business and a profit on every job with Quad Quick Detachable Reflectors.

QD Reflectors and Socket Fittings

QD Shallow Bowl Reflectors and socket fittings provide a practical and economical general purpose line. Readily adapted to a variety of indoor and outdoor uses. Available with three different types of keyless and pull socket fittings as shown below; all readily interchangeable, adding materially to the convenience and economy of Quad reflectors.



Horizontal Type (H) Fitting for lighting building exteriors, etc.



When reflectors must be mounted close to the ceiling, this outlet box reflector fitting is very practical, convenient, and not expensive.

With the three types of fittings shown practically all the requirements of a wide range of installation are met. The interchangeable feature saves time and money when installing.



Vertical Type (V) for use with all ordinary installations.

Quad Special Dome Reflectors provide a thoroughly practical line of reflectors for outdoor or indoor use. Intensive lighting may be obtained by close spacing. Strong simple and weatherproof construction. Easily wired interchangeable fittings for vertical, horizontal or outlet box mounting, as shown above.



For sign illumination, the Quad Spade Reflector gives straight line cut off of light—requires a shorter supporting pipe and produces uniform sign illumination. Permits better view of sign it illuminates. Reflector and socket housing are of one piece construction, easily wired and installed.



The Quad Open Type Flood Lighting Line with focusing beam projectors, practical, easily mounted and wired. With or without chromium plated copper beam projector. Used with Type J Wire Enclosing Bracket it can be adjusted 40° vertically and 180° horizontally. Ideal for all floodlighting purposes.

QUAD LIGHTING UNITS

QUADRANGLE MFG. CO. 30 S. PEORIA ST. CHICAGO, ILL.

tioner gave no area in his inquiry, and we, therefore, did not use Rule 2011 in our Chat. However, as Mr. Graham has raised the issue we can attack the problem with the use of Rule 2011 in a little different manner.

With a 3-wire No. 6 service we have 50 amp. at 220 volts, or 11,000 watts at our disposal.

Water heater.....1,500 Watts
9,000-watt range, 80% demand .....7,200 "

Total .....8,700 Watts
Available for lighting and appliances 11,000 — 8,700 = ...2,300 Watts

Now, a single-family dwelling of 2,833 sq.ft. area requires (Rule 2011-d-4) 2,833 watts — 1,000 watts (for appliances) multiplied by 60 per cent (demand factor for over 2,000 sq.ft.) = 2,300 watts.

Therefore, a 3-wire No. 6 service will properly supply the above installation providing the floor area of the dwelling does not exceed 2,833 sq.ft.

Number of Sockets Per Circuit

What is the maximum number of sockets permitted for cove lighting, outdoor signs, or any other use, when only 10-watt lamps are used?

The answer to this question comes from rule 3204-g which requires that the circuit shall not have a load of over 15 amp.

For a 110-volt circuit the number of sockets with 10-watt lamps is obtained as follows:

110 volts multiplied by 15 amperes equals 1650 watts; divided by 10 watts equals 165 lamps, each at 10 watts allowable.

For a 120 volt circuit:—
120 x 15 = 1800 ÷ 10 = 180 lamps, permitted.

Radio Transmitter Grounding Conductor

Under 3703-h, could a copper wire be used for the operating grounding conductor and, if so, what size is required?

This rule requires that if copper is used it shall be in the form of a flat strip, but if a wire is used it must be of copper bronze or copper clad steel and at least a No. 2 gauge.

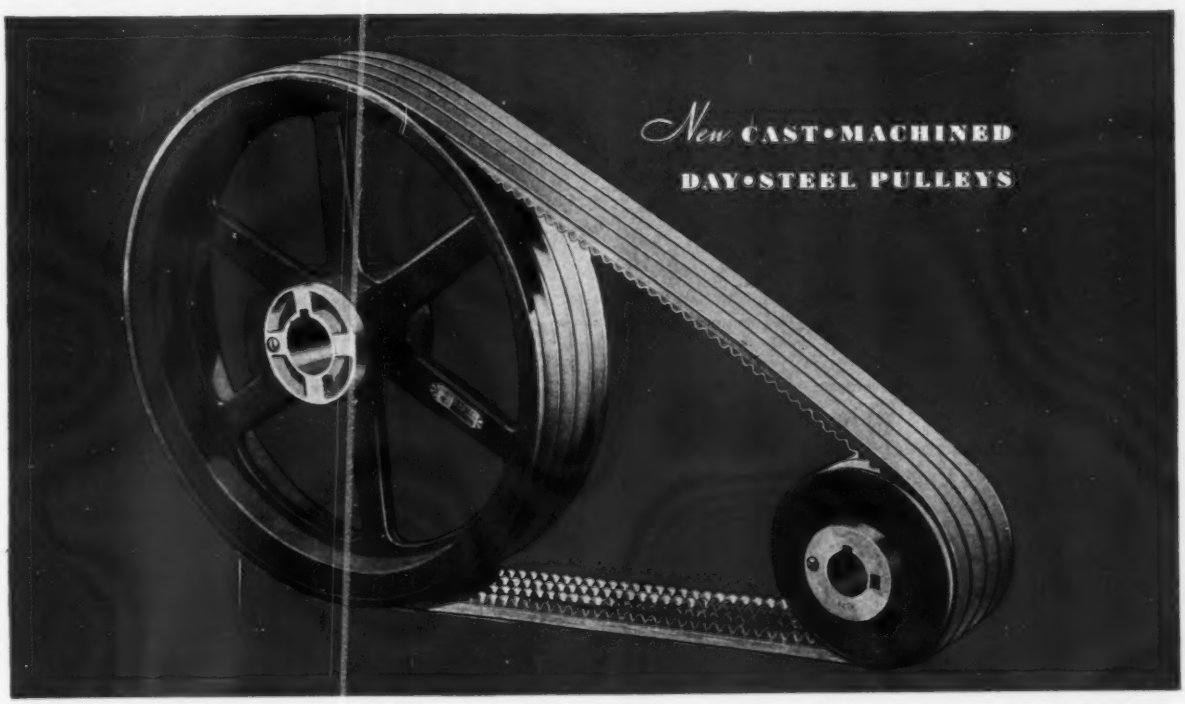
The bronze or steel is required for mechanical strength and the large size to provide area in order to limit the corona discharge.

Announcing

Dayton Cog-Belt Drives

with

New Day-Steel Pulleys



The new scientifically designed Day-Steel Pulleys used in conjunction with the famous Dayton Cog-Belts provide new economies in both original installation and maintenance costs.

These new Day-Steel Pulleys are of cast-machined (semi-steel) construction. The castings are so formed as to give maximum strength with the elimination of all excess metal, thereby providing pulleys of approximately the same weight as the pressed steel type.

All finished surfaces are machined to the accurate limits of precision work, the special semi-steel providing an exceptionally smooth and close-grained groove surface. All pulleys are accurately balanced to insure a true-running drive throughout. A high quality finish provides complete protection and gives a most outstanding appearance.

Stocks Quickly Available

Complete stocks are now available in all leading industrial centers.

Let us give you all the facts about Day-Steel Pulleys and Dayton Cog-Belt Drives—and the economy they will provide for you. Write for new and simplified catalog 110-C.

THE DAYTON RUBBER MFG. CO.
DAYTON, OHIO

World's Largest Manufacturers of V-Belts

Manufacturers also of Dayton Fan Belts, Dayton Red Tube Radiator Hose and the famous Dayton Thorobred Tires and Tubes

Dayton

COG-BELT DRIVES • DAY-STEEL PULLEYS

UMI

ELECTRICAL CONTRACTING

S. B. WILLIAMS, Editor

Recovery

IN spite of all the legislation that is bound to have a restricting effect on the profits of business, this summer was the best from the standpoint of volume that this country has known since 1932.

Many industries that normally are quiet in the summer months went right ahead with fine operations this year. New construction continues to make gains, particularly residential. The output of the power companies has exceeded the previous peak of 1930 for the same months. The list of companies paying dividends is growing daily.

Recovery takes time to get started but once under way can pile up momentum very fast.

—◇—

Strong Language

SOME pretty straight talking is engaged in by George Welman, the fearless Louisiana inspector, in an article in this issue. Most thinking contractors will recognize the complaints he makes and will agree that the things he asks for are far from being unreasonable.

In some ways we think that Mr. Welman might have used stronger language and still not have done justice to the enormity of the crime. We refer particularly to those contractors who accept business created by the inspector on reinspection, and then proceed to break down the inspector's recommendations and generally undermine him. It is impossible for a sane man to understand the crooked meanderings of a mind that will operate in that fashion. Not only does that man destroy already created business for himself, but by weakening the inspector's position with the public, he destroys business for others.

The electrical inspector is fast becoming a power in the electrical industry because of his unbiased position. His aid and assistance are needed by the contractor and all that he asks is that the contractor be reasonable and do things for his own good.

—◇—

Intolerance

IN almost all of our larger cities where there are two or more electrical contractor associations these groups are at logger-heads with each other. It is not a new situation but one that has existed for years. It needs some thought by leaders of the industry.

While the division of membership as a rule is that of closed or open shop, it nevertheless develops that one organization is composed of the larger operators and the other of smaller contractors. Management and labor relation problems, type of construction and equipment employed and other economic considerations are sufficient reasons to warrant separate associations. Are they sufficient, however, to warrant lack of understanding and appreciation of what the other is trying to accomplish or lack of sympathy with the other problems?

The larger operators have a responsibility in this connection of composing the existing differences. Because of their wider experience and for the most part longer years in the business, because of their larger financial position in the community and their contacts, they should be able to take the larger and more constructive viewpoint and take the initiative in bringing about a better understanding between the groups. Those who claim to be leaders must assume the obligations of leadership.

The smaller operators, because they do smaller work, are by no means carpet-baggers. The mere fact that they have effected an organization shows that they are thinking.

There are certain common interests that should cause the groups to work together. By their indifference and sometimes open antagonism to each other, do they not weaken their common cause? An examination of the past will show instances where sympathetic cooperation and understanding between the groups would have prevented the failure of desirable programs.

Is it not reasonable then to suppose that each group might gain considerably by cooperation and intermingling?

Extra Profits

A MAN who for years has had as a hobby the merchandising of house wiring, now brings forward an argument for adequate wiring which is very simple and should appeal to the average house-wiring contractor. While adequate wiring means a bigger service and more circuits, it also means more outlets. In fact, in the Red Seal plan that has been the goal—more outlets.

Now, says this student of house-wiring selling methods, if a contractor takes a job of forty outlets at a price, just for the sake of illustration, of say $3.00 per outlet, he has covered in that price the cost of the service and the circuiting. Therefore, says this fellow, every outlet that the contractor sells over and above this original number carries an extra profit. In other words, if the original job was profitable, then these additional outlets carry an extra profit equal to the amount allowed in the original outlet cost for service and circuiting.

If, as so often happens, a job is taken at a very close price, the selling of extra outlets is the only way of making a profit on the job without cheapening it. House wiring can be made to be profitable even at competitive prices, provided the contractors will sell these extra profit outlets.

Surface Wiring

ONE of the greatest problems that faces the electrical industry today is how to add more outlets in already wired homes. The growing use of portable lamps, radio and the new appliances has for a long time been creating a demand for more outlets.

This demand is being filled, but, unfortunately, not by the electrical industry. The public is doing its own wiring and for the most part with lamp cord purchased from the chain stores. The fire records show this to be one of the most hazardous forms of wiring known, yet home after home, apartment after apartment, is draped with cords.

The electrical industry in several cities has tried to sell the public additional outlets, wired concealed, and at as low a price as the contractors could quote and not actually lose money. Even the best of these campaigns have produced only a modest amount of business, while most of the campaigns have never gotten to first base.

Although the contractors have brought the price down to rock bottom in order to encourage buying, the public does not appear to be interested although it is a known fact that it is not satisfied with its own cord wiring. It wants something better. Landlords do not want their buildings endangered with cord wiring.

Between concealed wiring and cord wiring there is approved surface wiring. Does not this offer an opportunity? We know that there are many objections from different branches of the electrical industry, but the fact remains that if the industry takes the viewpoint that it will sell only concealed wiring, it must face the fact that the public will continue with cord wiring when it might have spent a lot of money for surface wiring.

There are a number of approved surface wiring systems on the market which require mechanics to install them. We feel that this is essential in order to assure the public of a safe installation. After all it makes no difference whether the wiring is on the surface or concealed, the same energy will flow and unless this wiring is safely installed, there is a dangerous condition.

The need of the electrical contracting industry today is more work. The need of the industry and the public is more outlets. If surface wiring by virtue of being lower in price, will provide these needs when concealed wiring will not, then the answer should be self-evident.

Stretch Test

MOST electrical men are familiar with the term "stretch test" as applied to conductor insulation. Another type of stretch test that is most severe is testing the resources of the motor and industrial equipment dealer. Credits are being stretched beyond all sensible periods of time as a competitive inducement, so that many dealers are almost stranded.

In the coal-producing areas the credit race has gone beyond all reason. Large operators are purchasing motors and equipment, taking as much as six months for payment. Those who are invited to bid are generally acquainted with this situation, but because of keen competition they have no choice but to comply with the evil.

An important contribution to the welfare of motor dealers and motor service shop operators would be a sensible adjustment and understanding of credits that would lift this self-imposed yoke from this important industry group.

UMI

Contracting .... News .....

Joint Committee on Business Building

The N. E. C. A. and the Edison Electric Institute have appointed representatives to a joint committee to discuss business building and economic problems of mutual interest. The first meeting will be held in Chicago on September 10.

Those representing the contractors are L. E. Mayer, President, N.E.C.A.; D. B. Clayton, president, Mill & Mine Construction Company, Birmingham, Ala.; W. W. Clark, president, Dingle-Clark Company, Cleveland, Ohio; G. M. Sanborn, president, Sanborn Electric Company, Indianapolis, Ind.; J. E. Averbach, president, Iron City Engineering Company, Detroit, Mich.

Those representing the utilities are G. W. VanDerzee, vice-president Milwaukee Electric Railway & Light Company (F. A. Coffin, alternate); C. E. Michel vice-president, Union Electric Light & Power Company (W. L. Berry, sales manager, alternate); Arthur P. Good, Commonwealth Edison Company; H. E. Young, vice-president, Northern States Power Company; J. D. Noyes, Detroit Edison Company.

Charlotte Has Revenue License Taxing

Electrical contractors of Charlotte, N. C., under the new revenue license ordinance which went into effect July 1, are taxed in proportion to the number of employees. Those employing three or less persons are taxed $15.00; more than three, but less than six employees, $25.00, and six or more employees, $50.00.

There is also a tax of $50.00 on armature winders; all dealers not otherwise specifically taxed, $10.00; radio dealers, $5.00; radio repairs, $5.00; repair shops not otherwise taxed, $25.00; sign hangers and erectors, $50.00.

Committee to Prepare Handbook of Wiring Design

Groundwork for preparation and promotion of a Handbook of Interior Wiring Design for architects, consulting engineers, general and electrical contractors and others was laid at the first meeting of a joint industry committee in New York City August 14.

Edward A. Brand of Buffalo was chosen permanent chairman at the New York City session. Organization of the joint industry committee was at the invitation of the Edison Electric Institute sales committee. A second meeting will be held about the middle of September. It is expected that the work will take all winter.

Appointment of a technical subcommittee to prepare the detailed design and specific data, and assignment of other parts of the handbook, which has been developed in outline, marked the initial meeting.

Basis of the work will be the Adequacy Wiring Standards for Residence Buildings developed in 1931 by a group similar to the present committee, together with the Minimum Specification for Adequate Wiring of Lighting Circuits in Commercial and Public Structures, and the Minimum Specification for Adequate Wiring in Industrial Structures prepared by committees of the old N.E.L.A.

Use of these documents in the field has indicated that they could be made more valuable and have a wider application if certain explanatory material were prepared to interpret the standards for the specification rider and indicating how to apply them to any specific job.

In addition to this technical material, the Handbook will have a section on the need for and advantages of adequate wiring, intended to sell the value and use of the standards to groups to which they are directed.

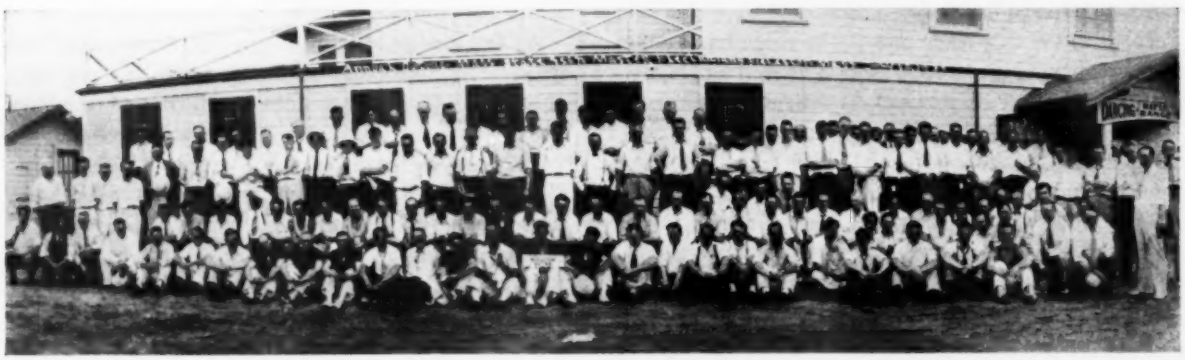
National associations represented in this work are: American Institute of Architects, Artistic Lighting Equipment Association, Edison Electric Institute, Illuminating Engineering Society, International Association of Electrical Inspectors, National Electrical Contractors Association, National Electrical Manufacturers Association and National Electrical Wholesalers Association.

Massachusetts Contractors Extend Organization

An organization movement that was begun early in 1935 at Boston, Mass., and likewise in various nearby communities prompted the first annual outing to be held on July 10 at Fieldstone, Mass. of the Massachusetts State Association of Master Electricians. The large number of contractors who attended this outing was looked upon among the new state organization officers as evidence that an active state group could be successfully maintained.

Eighteen communities are reported to have formed local associations of master electricians, of which eight locals are members as a whole in the new state group. The Master Electricians' Association of Boston, comprising 50 members, is one of these affiliated locals.

A provision of the state association excludes anyone from membership who is not a member in an affiliated local



Annual outing on July 10 of Massachusetts State Association of Master Electricians



Whatever your needs or preference in the matter of conduit, YOUNGSTOWN can supply and satisfy you. Youngstown "BUCKEYE" Conduit is made in three finishes:-

HOT GALVANIZED. Immersion in pure molten metal deposits a clean, smooth coating of zinc, inside and out, which is then coated inside and out, with a tough transparent enamel baked on at a controlled temperature.

ELECTRO GALVANIZED. First coated on the outside with pure zinc by the electro-galvanic process and on the inside with black enamel, a transparent enamel is then baked on both the outside and inside of the conduit at a controlled temperature.

BLACK ENAMELED. After thorough cleaning this conduit is dipped in a special, tough, elastic black enamel and baked at a controlled temperature, resulting in a finish which bends without coating fracture.

THE YOUNGSTOWN SHEET AND TUBE CO.
538 Manufacturers of Carbon and Alloy Steels
General Offices - - YOUNGSTOWN, OHIO

NEW!

A 16 page book that shows

"The Importance of the ELECTRICAL CONTRACTOR in selling the INDUSTRIAL MARKET"

for Electrical Manufacturers

This new booklet, fresh from the printer gives up-to-the-minute market data on "The Importance of the Electrical Contractor in Selling the Industrial Market." The information it contains will be of great interest to all manufacturers of electrical products marketable in the industrial field.

The contents includes a study of the buying habits of 109 plants in the city of Rochester; the products the electrical contractors buy; the number of industrial plants electrical contractors serve; and other vital market data.

This is a genuine market data book—not just another sales promotion piece. Send for your copy today.

ELECTRICAL CONTRACTING
330 West 42nd St., New York, N. Y.

Please send me, without obligation, "The Importance of the Electrical Contractor in Selling the Industrial Market."

Name..... Company.....

Address.....

.....

association. Each local association is represented in the state association by two delegates and two alternates. These delegates or their alternates attend monthly state association meetings, these being held in rotation in the various localities that have an affiliated local association.

The principal functions of local and state association meetings have been to develop among the rank and file contractors and dealers a close exchange of selling information that will benefit them in both merchandising and creative wiring sales. Open meetings are held at which power company representatives and the experts of various equipment and supply organizations are invited to offer advice in selling the public. The support by its members of the recognized channels of distribution, and the combating of bootleg wiring and unfair retail selling by certain wholesalers is claimed to have improved conditions in the organized localities. Some locals have accomplished definite improvements in range wiring practices with their power company.

According to George W. McShane, secretary of the Boston local, an active interest has been taken throughout the organization process with a constantly growing attendance.

Motor Dilemma Begins to Clear in New England

Encouraging prospects are becoming evident in the heavy industrial sections of New England with regard to the new motor market. Improved service shop conditions usually accompany such conditions. This forecast is predicated upon a general field inquiry in that section.

It is generally reported that staple motor sizes are in demand and that this market is no longer glutted with distress stocks of both new and used units. The long-hoped for absorption of cheap motor stocks that were being sold at par with quality rewind prices bids cheer to the motor industry. It appears to be well on the way to fulfillment.

Boston Voluntary Agreement Includes Estimating Bureau

Rapid progress is reported in securing the assent of Boston contractors to a voluntary code agreement. On August 12 the signed agreements of twenty-eight firms had been received, and eight others had given their verbal assent. This is a total of thirty-six members out of thirty-nine who comprise the membership of the Greater Boston Electrical Contractors Association.

The agreement provides for all members to secure quantity surveys from a central estimating bureau that is now in operation for all jobs requiring bids.

AMERICORE (CODE)
AMPARAK (INTERMEDIATE)
AMERITE (30%)
} + **Safecote**

= *Highest Quality Rubber Covered Wire*



The LESSON *in* INSULATION *and* FINISH

FOR years the quality in rubber covered wire lay in the insulation. **American Steel & Wire Company** with its three grades of building wires—**Americore, Amparak** and **Amerite**—has prided itself in the superiority of its products. Now the Safecote finish has been added. This remarkable finish will not carry or support flame—pulls more easily—does not soften or crack and is impervious to moisture. Furnished in all standard colors and made in sizes No. 18 AWG to 2,000,000 CM. Send for a sample—put a flame to it—bend it—and you will understand why Americore—Amparak or Amerite—with Safecote Finish—will serve you better and more economically.

AMERICAN STEEL & WIRE COMPANY

208 S. LA SALLE STREET, CHICAGO · · EMPIRE STATE BUILDING, NEW YORK

Offices in All Principal Cities

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

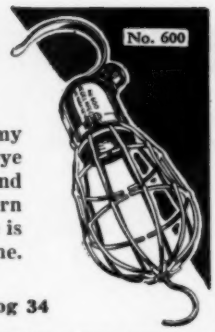
Export Distributors: United States Steel Products Company, New York

United States Steel Corporation Subsidiary

UMI



Lamp Guards
by McGILL



Lamp Guards prove to be an economy by saving breakage, theft, relieving eye strain, reducing accidents, spoilage and increasing production. Every concern can use them. Profitable sales volume is possible with the complete McGill Line.

A Type for Every Requirement—Send for Catalog 34

The Loxon—has the lock feature—stopping theft. Made with or without reflectors, for regular or Mill Type lamps.

Rubber Handle Portables—a line of portables with ten unusual selling features. Users like them.

Bulldog—strong, sturdy, copper plated cage rigidly fitted to hardwood handle, with Lever or Keyless socket.

Crescent — a light, strong guard, made of steel rods fastened to metal ring, and without socket.

Crescent Tubular—an ideal slender guard, 2-inch diameter, for tubular lamp.

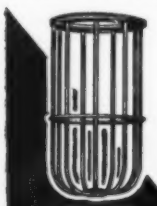
Hook Handle Portables — have many new patented features. 12 types. Take regular or rough service lamps.

Dreadnaught—a super-strong type of portable, with weatherproof composition keyless socket, wood handle.

National Portable—medium priced line—open cage with or without reflectors.

Crescent Wall Guards—ideal for warehouses, freight sheds, cellarways, factories, marine work, etc.

Gripon and Slipon Guards—stationary type—made for regular or Mill Type lamps—priced to sell readily.



Safety Vaporproof—useful around gases or inflammable materials. Heavy steel frame.

Protector "O" — a low cost, open bottom, heavily tinned stationary guard, for 25-60 lamps.



McGILL MANUFACTURING CO.
Electrical Specialties of Quality
ESTABLISHED 1904
VALPARAISO · INDIANA
Box No. 670

Hotel La Salle

CONVENTION HEADQUARTERS

National Electrical Contractors Assn.

SEPTEMBER 23-24-25, 1935

HOTEL LA SALLE—CHICAGO

CUT OUT COUPON BELOW IF ATTENDING AND MAIL TO HOTEL LA SALLE, CHICAGO

ROOM RESERVATION CARD

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION

September 23-24-25, 1935—Hotel La Salle, Chicago

Gentlemen:
Please make reservation for my arrival as indicated below:

Single room with bath, inside, $2.50.....
Single room with bath, outside, $3.00.....
Room with double bed and bath, $5.00.....
Room with twin beds and bath, $5.00 $6.00 $7.00.....
Two connecting rooms with bath for two, $4.50.....
Two connecting rooms with bath for three, $6.00.....
Two connecting rooms with bath for four, $7.00.....

Expect to arrive (date).....at about.....m.

Name.....

Address.....

A copy of the present agreement, which is otherwise largely in accordance with the former N.R.A. Code, has been submitted to the Federal Trade Commission. The commission has requested the petitioners to supply data as to the number of electrical contractors in the Boston area, their volume of business, also the number of contractors who desire the voluntary code, and their volume.

According to data compiled in the offices of the former L.A.C., during the period when the N.R.A. Code was operative, the thirty-nine members of the association did over $1,750,000, while 218 other firms of record did approximately $300,000. The same 1:3 helper ratio is provided for a minimum wage of 75 cents per hour, old article 7A, a bid depository and registration of contractors.

John Gray

John Campbell Gray, president of the Gray Electric Company, Detroit, Mich., died on July 24 after an illness of nearly seven months.

Mr. Gray entered the electrical industry shortly after the beginning of



John Campbell Gray

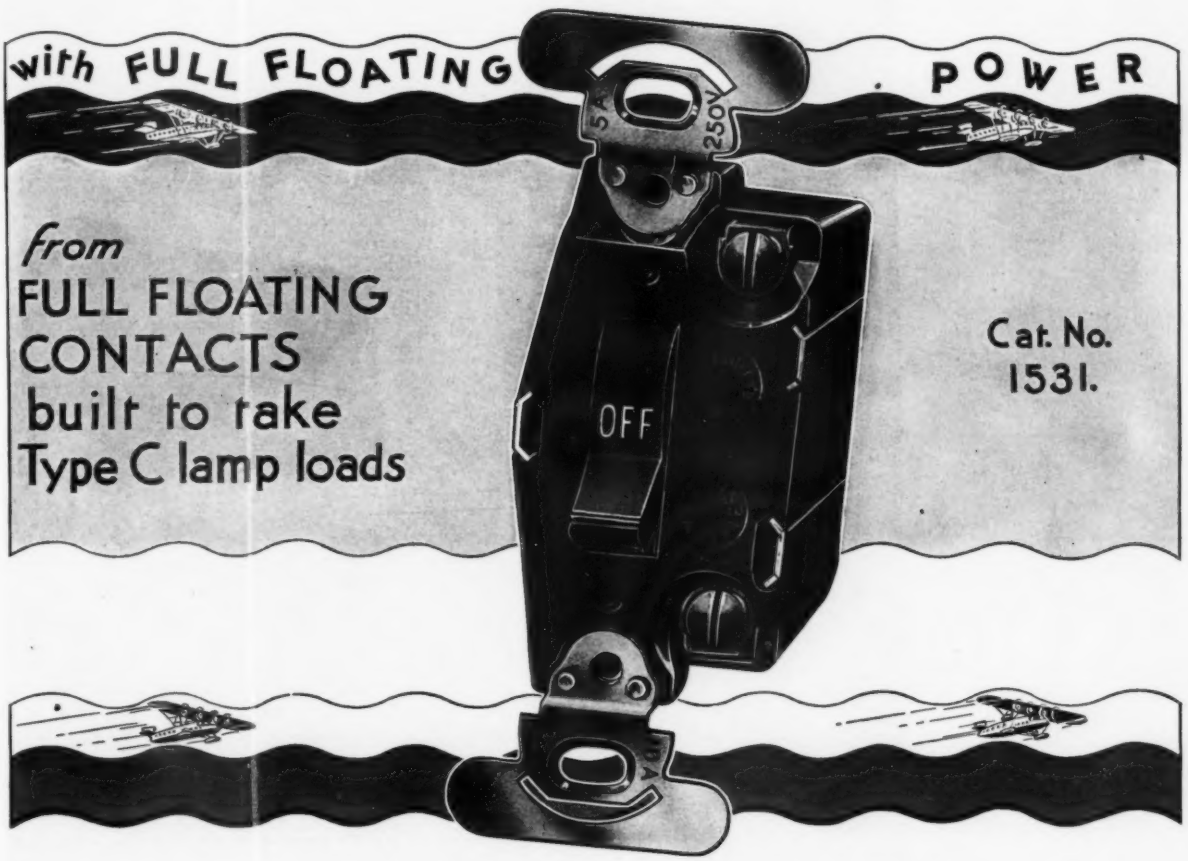
the century when with a brother, George W. Gray, he organized the Gray Brothers Electric Company, from which came the present company in 1917.

The Gray Electric has for years been one of the leading electrical contractors in Michigan, having many major installations to its credit. The busines will be carried on under the direction of C. O. Reckard and F. A. Bell who were associated with Mr. Gray for many years as vice-president and secretary-treasurer respectively of the company.

ARROW NEW Type C TUMBLER SWITCH

10 Amps
125 Volts.

with FULL FLOATING POWER



from
FULL FLOATING CONTACTS built to take Type C lamp loads

Cat. No. 1531.

This enclosed BAKELITE Switch is designed specifically to master the control-problem of high-intensity lighting. . . Mechanically and electrically it is engineered with the single objective of STANDING UP under Type C lamp loads in commercial, industrial and institutional buildings.

Full-floating, self-aligning moving contacts operate to automatically adjust themselves to the correct position and tension. The stationary contacts are tapered to smoothly engage the *moving* contacts without jar or rebound, removing the cause of burning or pitting when switched ON.

Arc snuffers on *both sides* and between moving contacts cool and quench any arc before it can damage the contacts or reach the base. . . The frame which supports the actuating mechanism is insulated from the mounting ears and yoke. Switch is completely enclosed, dust-and dirt-proof; is solidly held together by steel clamps with no fastening screws to loosen under vibration. Base is of Bakelite — narrow, shallow type — allowing ample wiring room.

The switch construction assures long life mechanically beside the rated load-capacity electrically. The action is smooth, easy, positive. You'll want complete listings on this "specialist" in Type C load-control.

ARROW ELECTRIC DIVISION
THE ARROW-HART & HEGEMAN ELECTRIC CO. HARTFORD, CONN.

UMI



CONTRACTORS—STOP GUESSING!

In these days of reduced office help and constantly changing costs, it is almost impossible for any individual to keep abreast of the price changes on the thousands of items used in the electrical business, yet every *guess* on prices is a *bad guess*—a probable source of loss.

A PROFITABLE INVESTMENT FOR EVERY CONTRACTOR

It's time to get back to fundamentals — to common-sense truths from which we should never have strayed!

Many Contractors seem to think that by increasing their volume of business they automatically add to their profits. It is human to strive for more business but in planning for the future contractors should not place too much dependence upon increased volume as the sole producer of PROFITS—consistent profits on the volume of business obtainable is a safer way to progress.

Today as you read this hundreds of successful Contractors and Dealers of every kind and size depend upon the NATIONAL RESALE PRICE SERVICE as a safe guide to fair prices and profits —fair to themselves as well as their customers.

If the NATIONAL RESALE PRICE SERVICE were a new and untried Service, you might be skeptical of its value. The fact that it has been recognized for years as an unbiased authority on Resale Prices for Electrical Contractors and Dealers offers convincing proof that you will not be experimenting by accepting it as your "Silent Partner."

A partner who will work every hour of the day, every day in the week without complaint helping you to build a profitable business. Many Contractors tell us that this Service adapts itself to their needs as well as anyone they might hire to do the same work—and for a fraction of the cost.

Don't dismiss the possibilities of this unusual service until you have investigated. We will gladly send full particulars and sample sheets without obligation, of course. Please attach the coupon to your letterhead as the Service is furnished only to those actively engaged in the business.

.....

HENDERSON-HAZEL CORPORATION
5005 Euclid Avenue, Cleveland, Ohio

Without obligation, please send us full particulars about the NATIONAL RESALE PRICE SERVICE.

NAME _____

ADDRESS _____

CITY OR TOWN _____

STATE _____ EC-9-35

HENDERSON-HAZEL CORPORATION

5005 EUCLID AVENUE **CLEVELAND, OHIO**

UMI

IRWIN
Electrician Bits
SPECIAL OFFER - *Only*
59¢

NEVER BEFORE HAVE THESE HIGH QUALITY BITS BEEN SOLD AT THIS LOW PRICE. . . . . .



It's the same speed boring, durable Bit that Irwin has always made to meet specifications of Electricians all over the country.

Special Bit steel, heat treated all over for long life and hard usage, deep cut screw point with durable cutter for fast boring and finished in our new golden bronze color. Supplied in the standard 11/16" size, 10" over all.

Buy Now and Save

Insist that your dealer or jobber supply you with Irwin Golden Anniversary Electrician Bits.

The Irwin Auger Bit Co.
Wilmington, Ohio



BELLS BUZZERS TRANSFORMERS

SIGNAL Bells, Buzzers and Transformers are widely known for their high quality and low price. The bells are available in 2½", 3", 4", 5", 6", and 8" sizes, single and double coil. SIGNAL also offers a complete line of skeleton and weatherproof bells. If your jobber does not stock Signal bells, buzzers, and transformers, write

SIGNAL ELECTRIC MFG. CO.
Menominee, Michigan, U. S. A.

OFFICES IN PRINCIPAL CITIES

MANUFACTURERS OF ELECTRICAL PRODUCTS
SIGNAL

A Roll o' Tape

Electrical Flashes gathered among the big wire and pipe men

by
Electrical Contracting's Field Editors

ONE industrial engineer-salesman is kept busy on outside calls over a radius of 50 miles from Woonsocket, R. I., by the Electrical Maintenance and Engineering Works, local industrial specialists.

JOB shanties are so constructed by Quinn Brothers of South Boston, Mass., as to be knocked down in sections. Upon the completion of a job they are easily hauled to the warehouse for safekeeping until needed again.

A SIMPLE warning from a successful motor service shop pioneer. C. E. Harmon, president of the J & H Electric Company, Providence, R. I., interprets as suicide any attempt to lower the quality of workmanship to meet low prices.

THE motto "Service you can depend upon" means much to George Brooke, pioneer electrical contractor of Port Washington, N. Y. His customers cannot buy cord-extension wiring materials there. Only correctly-wired outlets will preserve the motto to Mr. Brooke's satisfaction, and the small revenue to be derived from flimsy wiring material sales is not considered worth a let-down in policy.

EXECUTIVE responsibility has not weighed so heavily during the depression upon the shoulders of those larger electrical contractors who made their department heads officers and shareholders in the business, believes Walter A. Blan of Middletown, Conn. Blan's Electric Shop, Inc., is an organization in which its key workers are interested as stockholders in low over-

MINERALLAC
Cable or Conduit Hanger
Jiffy Clip

Now furnished in EVERDUR as well as Cadmium Plated Steel.



Cable or Conduit Hanger
Rigid Conduit—⅜"—2½"
Thin Wall—½"—1½"



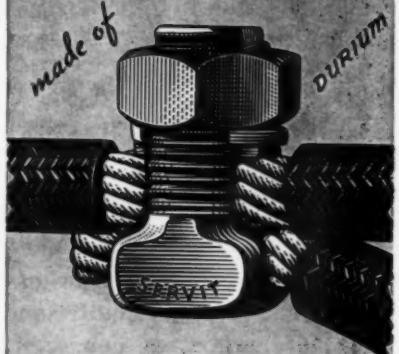
Jiffy Clip—Rigid Conduit
⅛"—1¼". Also B X Cable

Ask your Jobber

MINERALLAC ELECTRIC CO.
25 No. Peoria Street, Chicago, Ill.

New York City Branch
381 Fourth Avenue

BURNDY
SERVIT



STRONG—tougher than steel, re-usable, withstands abuse
CORROSION FREE—resists salt air, fumes, will not season crack
COMPACT—easily taped, neat

BURNDY
ENGINEERING CO., INC.
305 EAST 45TH STREET, NEW YORK
Agents Everywhere



HAZARD INSULATED WIRE WORKS

Manufacturers of Insulated Wire and Cable for Electrical Contractors

Division of

THE OKONITE COMPANY

Factories: Wilkes-Barre, Pa. Passaic, N. J.

YOU NEED

MICABOND

INSULATING TAPE FOR PROFITABLE REPAIR WORK

Micabond Tape, Paper, Cloth, Fish Paper, and other types of this adaptable insulating material insure profitable, high grade repairs. Samples will be gladly furnished.

CONTINENTAL-DIAMOND FIBRE COMPANY
NEWARK, DELAWARE
CHICAGO
CLEVELAND
NEW YORK

SHERMAN



TINNED SPLICING SLEEVES (SPLIT CONNECTORS)

• Correctly designed — accurately made of purest copper.

These Sleeves can be used on round or sector shaped cable and are so designed that when properly soldered, the wire will break before loosening in the sleeve.

Tests made on Sherman Sleeves have proved that they have no tendency to overheat.

Sold Thru Jobbers
Write for Trade Bulletin No. 20

H. B. SHERMAN MFG. CO.
BATTLE CREEK MICHIGAN

head, new customers, wider markets, good service and a profit. After twenty-six years in business, Mr. Blan finds this recent plan working successfully, and it has not been necessary to reduce a trained personnel for want of revenues.

W. J. SHAEFER of Shaefer Electric Company of Middletown Conn., points with pride to providing adequate copper on his jobs. A local remodeling job which comprises eight apartment suites above two average store rooms is being completely rewired, and is to have a service consisting of three 350,000 c.m. cables.

ELECTRICAL men should be given special lighting rates, if they maintain attractively lighted windows for displaying utility load-building appliances, in the opinion of Geo. W. Richardson, Lancaster (Pa.) Electrical Supply and Construction Co.

CAREFUL handling of regular customers, and "thumbs down" on out-of-town jobs has paid big dividends for Norman Abel of I. B. Abel and Son, York, Pa. One local industrial plant has had a re-wiring program under way for the past year, and it gave the job to Norman. An average nine-man crew is kept employed in this shop.

IT costs about 85 cents per hour to operate a 216 cu.ft. gas-heated oven in the service shop of the Industrial Electrical Construction Co., York, Pa. This is considered an efficient operating cost, and bears consideration on "lone wolf" bake-out orders.

TRAINING young men for motor repair work is carried on systematically in the shops of the Industrial Electrical Construction Co., York, Pa. Special interest is taken because two members of this firm received vocational training as boys. New students start their apprenticeships in pairs, and alternate at study and in the shop for two-week periods, thus one apprentice is always at hand. When they become capable of more responsible duties, a new pair of apprentices is enrolled.

COX ELECTRIC CO. at Red Bluff, Calif., probably scared a good many people into getting some much needed wiring done. Using the popular interest and alarm over the bites of the black widow spiders, a window display was used warning the onlooker that such spiders lurked in dark places and that plenty of light was the best protection against these deadly insects.



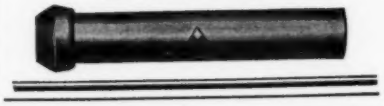
For
Residence Wiring

The Best and Safest Method is a properly installed KNOB and TUBE job. Be sure and get the

TRADE MARK Bull Dog REGISTERED

Assembled Knob because it "HAS A GRIP LIKE ITS NAMESAKE."

ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS



MULTI
REFLECTORS



Multi Reflectors built for the highest lighting efficiency in factory, shop or office. A serviceable lasting reflector, rust-proof, with three coats of Porcelain Enamel. Made in all standard sizes and shapes.

2 Piece Dome Reflectors



With white diffusing glass globe and all white Porcelain Enamel reflectors. The Multi "Gripit" holder absolutely prevents breakage from vibration. A superior lighting fixture of highest efficiency for office or shop.

BUSHINGS



Multi bushings of all types for use wherever electrical circuits pass through metal. Built in a large variety of styles to suit every purpose.

Multi bushings are handled by leading distributors throughout the country.

Send for Complete MULTI Catalog

MULTI ELECTRICAL MFG. CO.
1840 W. 14th ST., CHICAGO, ILL.

FOR QUALITY WORK

PIPE & CONDUIT

HANGERS



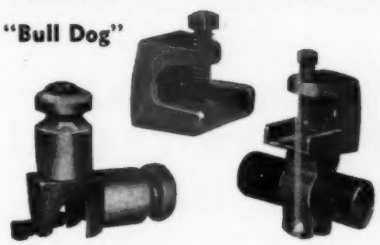
2½" conduit attached to No. 403 Insulator Support with No. 466 Pipe Hanger.



¾" conduit attached to No. 401 Insulator Support with No. 461 Pipe Hanger.

INSULATOR SUPPORTS

"Bull Dog"





High in tensile strength, Bull Dog Supports are made of verified malleable iron. For use in fastening porcelain and glass insulators to exposed steel framework when wiring industrial plants. They are made in four sizes to accommodate all standard porcelain or glass insulators.

The cup pointed, hardened steel set screws in "Bull Dog" Insulator Supports are inclined at a slight angle to insure a real "Bull Dog" grip on the steel framework. "Bull Dog" Insulator Supports are Cadmium plated to insure against rust.

Send for Trade Price Sheet No. 250

"Latrobe" FLOOR BOXES

FULLMAN

MANUFACTURING CO.

LATROBE, PENN.

MFRS. of QUALITY FLOOR BOXES & WIRING SPECIALTIES

Sold many incandescent lamps and several basement wiring installations from this window.

THE wiring and service employees of the George W. McShane Company, South Boston, Mass., are supplied with work blouses and caps bearing that company's name.

READY-MADE coils solve quite a wire stock problem for the smaller motor service organizations who operate in the Pennsylvania coal mining region, according to Moy and Bradbury of the Electric Repair Shop, Hazleton, Pa.

UPON examining various framed membership certificates in the H. H. Roth quarters at Wilkes Barre, Pa., one learns that this organization dates back to the grandfather of its present proprietor.

GOOD business comes from good leads, and the employees of Clapp, Rose & Vaughn, Inc., Waterbury, Conn., furnish many of them according to L. A. Rose. Some are wiring jobs, others oil burner sales, but an office employee recently led the way with three refrigerator sales in one week.

BOOKKEEPING and coil taping hardly sound like jobs to be done by one and the same person. However, Miss Dora Lyman brings motor coils into the office from the shop of E. J. Wood & Company, Danbury, Conn., and devotes her spare time to lending the shop a hand. Miss Lyman tapes neatly, makes no muss in the office, and enjoys this part of her work almost as much as her office routine.

WHEN Barnes-Pope Company of Boston, Mass., undertook a commercial storage battery service contract, some years ago, in connection with its commercial and industrial wiring business a new wiring field was also developed. Several desirable wiring jobs on harbor and pleasure craft resulted through this connection.

CONTRACTORS who undertook jobs of remodeling the wiring in the school buildings condemned for earthquake hazard in southern California often found themselves in quite a predicament. Figuring was pretty close, because of keen competition for these few jobs then existing and contractors usually counted upon using existing conduits embedded in concrete. Imagine their embarrassment, says C. S. Taylor, of Bennett & Taylor, when they found that the concrete men went in ahead of them with air hammers and cut or

It pays to know

THE LATEST IN LIGHTING EQUIPMENT



NEW DATA BOOK

Right off the press, a 64 page book, illustrating and describing the SILV-A-KING line—one of the largest lines of commercial and industrial lighting equipment in the world. Many new items are included—commercial and industrial reflectors—floodlights—spotlights—vapor proof units and accessories.

This book is a real sales tool for the electrical contractor selling industrial and commercial work. A copy is mailed free, without obligation, upon receipt of the coupon below.

BRIGHT LIGHT REFLECTOR CO.

Metropolitan & Morgan Avenues

BROOKLYN NEW YORK

Please send me your new catalog No. 36

Name .....

Address .....

Please check below for future mailings.

☐ Contractor ☐ Wholesaler ☐ Industrial Plant

This Kitchen Ventilator Has Everything You Want!



THE VICTOR IN-BILT



Automatic Operation

For Both New and Old Homes!

HERE are just a few of the features this Victor Ventilator offers: Full 12" fan—powerful induction type motor—weather-tight shutters—beautiful interior grille hinged for easy access to clean blades—beaded chain controls both shutters and fan—special 3-speed switch. And—a surprisingly low price!



3-Speed Control

Easy Installation!

Designed to make your work easy—has tubular wall sleeve adjustable to any thickness. Wiring connections simplified—no chance for trouble. Can be easily installed in both new or old homes—any type of construction. Send today for complete literature and installation details.



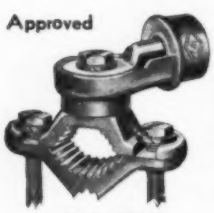
Victor Force Air Exhaust Fans!

Be sure to get acquainted immediately with the Force Air Line. A powerful fan for every purpose and at a price that will delight you. Better performance and lasting satisfaction guaranteed! Ask for literature and prices today!

VICTOR ELECTRIC PRODUCTS, Inc.
716 Reading Road Cincinnati, Ohio

SHERMAN
RIGID GROUND FITTINGS

Approved



GF 5 FITTING FOR RIGID CONDUIT

SOLDER AND SOLDERLESS

This Fitting is manufactured in a manner which provides absolute protection to the ground wire connection. Made with a heavy cast brass soldering lug which allows a soldered or a solderless connection. Adjustable to any position, easy to install as clamping screws need not be removed. Pipe clamp may be reversed for use with ground rod.

Sold Thru Jobbers

Send for bulletin No. 12 describing complete line

H. B. SHERMAN MFG. CO.
BATTLE CREEK, - - MICHIGAN

bent the conduits they happened to run across into unusable shapes. This often ran the actual cost of school remodeling jobs far above estimates.

THE promotion of adequate lighting requires patient effort. Persistence brought a job in a publishing plant for the Snyder Electric Co., Harrisburg, Pa., that has resulted in steady wiring orders since the main job of relighting the main areas commenced over a year ago.

QUICK reference to old articles in ELECTRICAL CONTRACTING is possible as a result of filing such articles in subject folders that were designated by the engineer in charge of estimating and supervision for the Economy Electric Supply Company, Worcester, Mass.

BARNS are not to be belittled as wiring jobs, according to George Parks, engineer-estimator for Keystone Engineering Corp., Reading, Pa. This company recently secured a nice contract for wiring the Berks County barn.

SUMMER weather has not caught P. E. Bomgardner of General Engineering Co., Inc., Reading, Pa., without sales objectives. Attic ventilation has been found a worthwhile field, and modern units are placed where all may view them.

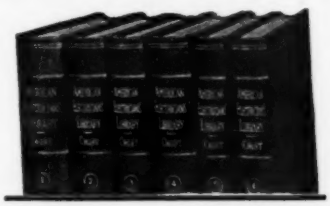
MOTOR service shop overhead items involve more than daily payrolls and general operating expenses, according to the Hudack Electric Motor Co., Scranton, Pa. Long-time investments in heavy, flat wire, emergency starters and resistors are items that must be recognized as necessary to give quick service to heavy industries.

JOE LAMPERDI, proprietor of the attractively and efficiently arranged shop and store of North Bay Electric Works, San Raefel, Cal., is one of the most versatile contractors to be found. Not long ago he just about built himself a new house without help, and an all electrical house it is, too. Particularly tricky is the indirect lighting he devised for the living and dining room. He finds that his own house serves as a good example of what he can do for his customers.

ROBBINS MOTOR WORKS, Santa Rosa, one of the neatest motor shops in California, has adopted a novel means of identifying the rewinds turned out by that shop. Mr. Robbins has adopted a distinctive color of dark maroon paint to finish all motors which he has rewound. A dark red motor is his best advertisement, for they usually stay rewound when he does them.

The easiest way to get ahead in electricity—

through the other man's experience as found in books



Whatever "getting ahead" means to you as an individual, there is no principle so important as backing up your brain with the other man's experience. Why spend time and effort to find out what has already been learned and put down for all to see in books? Here, for instance, are all the results of a rich experience in every stage of wiring, installation and contracting work gathered and set down for you in

Terrell Croft's

AMERICAN ELECTRICIANS' LIBRARY

(6 volumes—over 2,000 pages—fully illustrated)

In six really magnificent volumes this library gives the most thorough, most complete and easiest-to-understand treatment of the more specialized phases of electrical practice in print today.

"How" and "why" for Maintenance Men

The books show the best ways to make installations for every type of conduit wiring job—they tell how to handle every kind of lighting and switch problem—they give tips on short-cuts for saving time on routine jobs—they show the quickest and surest methods of locating and remedying circuit troubles. Alternating current armature winding, electrical machinery control diagrams and machinery erection are some of the things covered in detail.

Diagrams

In all, these books contain more than 1,000 clear, easy to follow diagrams, with wiring instructions written in simple language. It is unnecessary to tell you how valuable is this one feature alone.

Small monthly payments

You may examine these books free for 10 days by sending the coupon below, filled out. In addition, if you decide to keep the books you have the privilege of paying for them in easy monthly installments *while you use the books.* Make sure you are not passing up *your* best bet for getting ahead. Mail the coupon today.

FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc.,
330 W. 42nd St., New York, N. Y.

Send me Croft's American Electricians' Library, 6 volumes, for 10 days' free examination. If I find the books satisfactory, I will send you $1.50 in 10 days, and $2.00 a month until $17.50 has been paid. Otherwise I will return the books postpaid.

Signature .....

Address .....

City and State .....

Firm or Employer .....

Position EC-9-35
(Books sent on approval in U. S. and Canada only.)

Manufacturers' Bulletins . . .

Conduit Fittings: A new catalog covering the Simplet line of conduit fittings has been issued and is available upon request. Simplet Electric Co., Chicago, Ill.

Surface Extension Wiring: "Addhere" flexible rubber raceway wiring system, designed to be cemented to walls or woodwork. An illustrated folder describing installation methods for raceway and outlet fittings. The Bryant Electric Co., Bridgeport, Conn.

Pulleys and Drives: Catalog No. 110-C describes Day-Steel pulleys and Cog-Belt drives. Tables are included for applying these products which are said to require no engineering or calculations. The Dayton Rubber Mfg. Co., Dayton, O.

Switches and Starters: Colt-Noark catalog No. 58-S comprises 82 pages in three sections, covering safety switches, motor starters, and meter service switch equipment. The latter section includes accessories and attachments in connection with service equipment. Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.

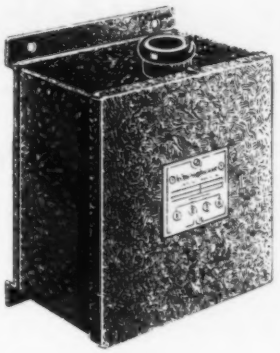
Reflectors: A complete line of reflectors for individual or combination mounting of mercury vapor lamps is announced in a new section of the Ivanhoe reflector and fittings catalog. Section 1 comprises pages 45 to 54, completely illustrative of various shapes and designs together with operation and installation information about the mercury vapor lamp.

Paper Insulated Cable: Bulletin GEA-1278B describes four cable improvements, namely: compact-strand conductor, paper insulation applied in graduated layers, treatment with carbon-dioxide gas, and hydrogen-processed lead-sheath. Oil filled, shielded type H, non-shielded and Pyranol cables are also described. General Electric Co., Schenectady, N. Y.

Steel and Tubes, Inc., Cleveland, O., announces a copyrighted "Bending System" or code for making accurate stubs, back-to-back bends, offsets, etc., when installing electrical metallic tubing. Each bundle of this company's tubing has attached to it a shipping

(Continued on page 83)

Be sure its "Westinghouse" and you're sure it's RIGHT



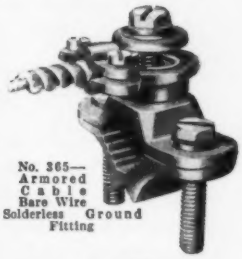
. . . wherever you need signaling transformers for bells—gongs—sirens—time clocks—annunciators—signaling systems.

There's no better way to avoid trouble and complaints in signal system installations of every type than to standardize on Westinghouse Signaling-Type Transformers. Ratings range from 50 to 1000 watts; tap voltages from 24 down to 4, in steps of four volts. All have the dependability which users of Westinghouse equipment know they will get. Listed by Underwriters' Laboratories. Get complete information from your nearby Westinghouse iobber . . . or write us direct. Westinghouse Electric and Manufacturing Compa .y, Room 2-N, East Pittsburgh, Pennsylvania. R 52080

Westinghouse



No. 574-VB—Bare Armored Ground Wire Connector



No. 365—Armored Cable Bare Wire Solderless Ground Fitting



No. 255 and No. 256—Service Entrance Cable Heads

Build up prestige and good will by installing quality materials in all your jobs.

STEEL CITY PRODUCTS

help the electrical contractor gain a reputation, not only for furnishing quality products but workmanship as well, because they are manufactured in accordance with the workman's needs, insuring speedy, dependable performance at all times.

We manufacture a complete line of outlet boxes, covers, switch boxes, conduit fittings and electrical specialties, furnished in sherardized, galvanized, enameled or cadmium finish.

WRITE FOR OUR NEW CATALOGUE

STEEL CITY ELECTRIC CO.,
PITTSBURGH, PENNA.

Gentlemen:

Please send a copy of your new catalogue to

Name .....

Address .....

.....

Help them select YOUR PRODUCTS!

ELECTRICAL CONTRACTING BUYERS REFERENCE NUMBER

In Three Sections:

DIRECTORY SECTION

A complete directory of all manufacturers of apparatus, equipment, materials and supplies used in the generation, transmission, distribution and utilization of electrical energy. Will be completely classified by products with cross references and descriptive sub-headings. Will include Trade Names with the manufacturers listings. Directory listings will be given to reliable manufacturers free of cost.

An opportunity will be given manufacturers who wish to gain special attention and consideration for their products, to lift them out of the common listings. Advertisements of such products will be placed in the Directory Section, interspersed among the directory listings. This will enable manufacturers to show illustrations and give descriptions to advertise their products where buyers are looking. Advertisers will have their name and address printed in bold face type with a reference directing the buyer to the advertisement.

PRODUCTS EXHIBIT SECTION

Advertisers will also have an opportunity of presenting institutional material in a special section. In this section full page space will be the minimum. It will be for general company information such as lists of sales offices, location of service shops, etc. These pages will also be referred to by page number, in bold face listings in the Directory Section.

COMPANY AND TRADE NAME INDEX

All company names and all Trade Names appearing in the classified Directory Section will also be listed in alphabetical arrangement in a special Company and Trade Name Index. This will facilitate instantly locating the address of any company whose name alone is known or to ascertain the name of the maker of any product known by Trade Name only.

A Complete Buyers Reference Service

for

- **ELECTRICAL WHOLESALERS**
- **ELECTRICAL CONTRACTORS**
- **INDUSTRIAL PLANT ELECTRICIANS**

20,000 copies of the new Buyers Reference Issue of Electrical Contracting will be distributed to Electrical Wholesalers, Electrical Contractors and Industrial Plant Electricians. It will serve them as a buying guide throughout the year.

This thirteenth annual issue (formerly published as Electrical Trade Catalogs) will consist entirely of material to help buyers quickly find the many electrical and kindred products they specify, requisition and buy. It will be divided into 3 sections (listed on this page) and substantially bound to withstand the constant usage to which it will be subjected throughout the year.

When buyers are looking up sources of supply, *help them select YOUR products.*

Make it easy for them to select your products by telling about them! Make it easy for them to identify your products by showing your trade marks and illustrations! Make it easy for them to get your products promptly by telling where your sales offices, distributors or warehouse stocks are located!

Once a year this opportunity comes! Forms close October 5th.

ELECTRICAL CONTRACTING

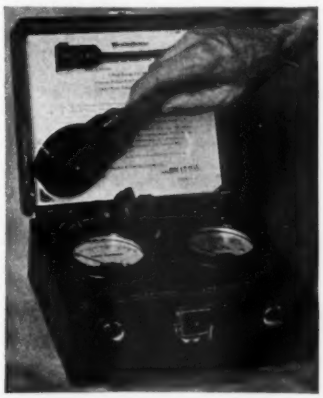
Directory Department

330 W. 42nd Street **New York City**

New Products . for September..

Illumination Analyzer

A light meter and combination voltmeter-ammeter for analyzing illumination voltages and current consumption in addition to foot candle intensities. This instrument is provided with cable



extensions, switches and plugs and is in a compact case. Watts input and light output can be measured with this combination, while the readings can be interpreted into efficiency from the complete data thus obtainable. A Photox cell foot candle meter is mounted on a paddle so that it can be held in any position without disturbing the analyzer. Two ammeter scales of 0-3 and 0-15 amps. are provided and voltages from 0-300, either a.c. or d.c. A plugging receptacle is provided on the main instrument into which a cable can be plugged to furnish power to the lighting circuit, or fixture, under test. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

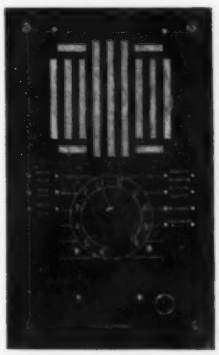
Reflectors for Mercury Vapor Lamps

A line of reflector equipment designed for the use of mercury vapor lamps in various styles and mountings. Combination reflectors are available which permit the use of incandescent lamps along with mercury vapor lamps in a single fixture. It is claimed this design permits mountings as low as eight feet with distribution of light having ideal color quality. A wide selection of types for individual lamps as in high-bay industrial conditions has been developed, thus offering equipment which makes possible the use of mercury vapor illumination in every branch of industry. The Miller Co., Meriden, Conn.



Intercommunicating Speakers

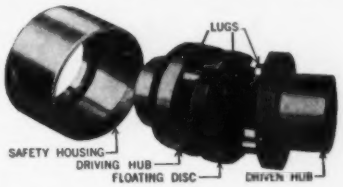
A system of voice transmitters and amplifiers for homes, offices, stores, etc., called the Vocalphone, which is said to operate clearly between stations, while ordinary conversations are conducted in any part of a room. The speaking person is not confined to fixed transmitter locations, likewise the picked up sound may be amplified to be heard clearly amid noises, or at considerable distances from a Vocalphone



station. It is recommended for residence use at the front door, in servants' quarters, in the nursery, and also in various commercial applications. Master stations are equipped with a radial selector switch for calling outlying points and for picking up conversations or other noises from such stations. Outlying stations are available for receiving voice instructions and immediate answering without the use of ear phones or transmitter mouth-pieces. This advantage is featured for servants' quarters, front entrances and commercial uses. The system operates on a.c. without batteries, and employs four standard radio tubes. The Doorman Manufacturing Co., Los Angeles, Calif.

Self-Aligning Coupling

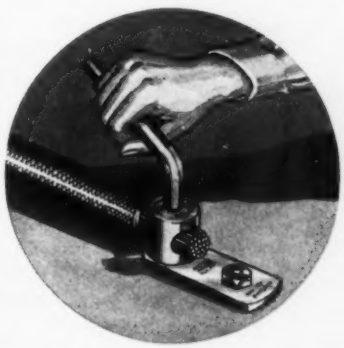
A four-part self-adjusting coupling for taking care of misalignment on direct connected motors. This product is recommended for drives where the equipment is likely to be subjected to expansion, contraction, angular or parallel misalignment while in opera-



tion. Two driving hubs each with two round lugs, engage a bone fiber drive disc in which long lug recesses have been provided. These recesses permit the lugs to slide in them to meet any misalignment which may occur. A safety cover is provided for the assembled hubs. Noiseless operation, reduced power losses, reduction of bearing wear, and long life are claims advanced for Uniflex couplings. Alloy Products Corp., Waukesha, Wis.

Solderless Lugs

Bull Dog "Wire Grips" are made in five sizes which will accommodate all



wires and cables ranging from No. 14 to 1,000,000 c.m. A special "cold flowed" process is claimed to increase their mechanical strength, thus permitting tight clamping for good contact. Clear wire holes permit visual inspection of the contact established between the connector and conductor. The 60 amp. size is tightened with a screw driver, while 100 amp. sizes and over employ socket-head wrenches. Bull Dog Electric Products Co., Detroit, Mich.

Recessed Window Reflector

A show-window reflector unit for flush mounting which includes a stippled glass lens that is claimed to be quickly removable for relamping or



cleaning. This unit is said to be easily installed, because its reflector is flanged out for fastening purposes. This flange also supports the bezel or lens retaining ring. Reflectors are made of highly polished solid aluminum alloy, said to be non-tarnishing, and have 2¼ in. shadeholder necks. The 75-100 watt No. 440 unit diameter is 9¼ in., while that of the 150-200 watt No. 445 unit is 10¾ in. Wilson Lighting, Inc., Chicago, Ill.

Industrial Thermometer

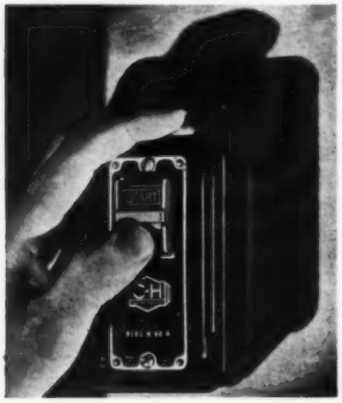
A "spot" device, "Ideal Tel-Temp" for quick and accurate determination



of temperatures in both open and closed motors, bearings, air compressors, pumps, etc. Comprises two parts, a base for attaching to the machine frame with escutcheons, which has a threaded stud to receive the dial case. An indicating dial plate and dustproof aluminum case is provided. Temperature readings from 0 to 100 deg. Centigrade are provided for on a scale which has a background of green, orange and red for indicating safe, caution and danger zones. Because the bases are separable from the dial cases, additional ones may be attached at various machinery units for the ready attachment of dial cases whenever temperature readings are wanted. Ideal Commutator Dresser Co., Syracuse, Ill.

Motor Starter

A compact motor starter, Bulletin 9101, for fractional horsepower applica-



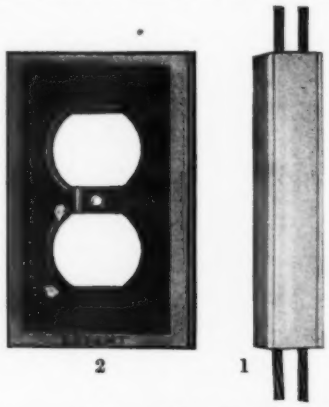
tion, which has a free-tripping thermal overload mechanism. Overloads are instantly indicated by the return of the operating button to the "off" position. The overload mechanism is reset when the "start" button is pushed. Heater coils can be had for diffeernt sizes of motors, and they are readily accessible from the front of the switch by means of a removable cover plate. Other features include: flexibility for various mounting conditions, silver-to-silver "twin-break" contacts, ease of wiring, non-rusting mechanisms and knockouts at top and bottom. Cutler-Hammer, Inc., Milwaukee, Wis.

Oil-Immersed Starters . . . .

Oil-immersed magnetic starters of the reduced voltage autotransformer type, in which all arcing contacts are 6 in. under oil. An induction-type temperature overload relay is used, also mounted in the oil. Either current-limit or time-limit acceleration is available, and an ammeter attachment can be supplied if desired. Ratings range upward to 600 amps., at 600 volts and 200 amps., at 2500 volts. General Electric Co., Schenectady, N. Y.

Surface Wiring System

A flexible non-metallic wiring material, with fittings, named "Addhere," employing rubber raceways over bare conductors which can be cemented directly to the wiring surface. Circuit conductors are enclosed in a flat rubber

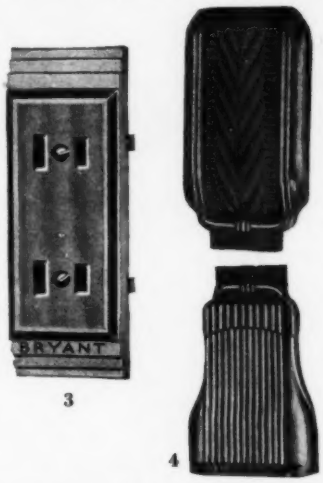


2 1

raceway which consists of two lengthwise cells. The bare stranded wires which lay in these cells are available for outlet connections by making two slits in the top portion of the rubber casing. Outlet fittings are available for attachment at any point along the length of raceway, whether it is run on or above the baseboard, upon wood trim, or directly above or below the picture molding. A special cement for use with this raceway is claimed to adhere firmly to many types of wall surfaces thus greatly eliminating the use of other raceway fastening devices.

An extension fitting (No. 2) has been developed for making raceway connections to existing wired outlets. The raceway (No. 1) may then be routed for any desired distance around the room. Wall outlet fittings (No. 3) are designed to fit over the raceway, and may be installed at any desired point of its length.

A new pendant material, with fittings, (No. 4) is designed to be hung from the picture molding. This pendant resembles a bell pull. It is of fabric and encloses insulated wires which are connected to a triple current tap. The upper end of this pendant includes a combined junction device for raceway tapping and a fit-



3 4

ting for attachment to the picture molding. "Addhere" raceway and its outlet fittings are made in four colors (white, ivory, jade green and brown), and may be painted, lacquered or enameled in other colors. The pendants are made in six colors. They may be dyed, painted or re-covered with other fabric to match the wall covering. This material is to be distributed through electrical jobbers, whose sales of "Addhere" wiring material are claimed to be restricted to licensed electrical contractors. Bryant Electric Co., Bridgeport, Conn.

Bakelite Range Cap

A 50-amp., 90 deg., range outlet cap made of bakelite in which the wires enter straight into solderless connectors. A tight, quick assembly is said to be possible, while the appearance of the range outlet is improved. An adjustable cable clamp is built into this No. 7952 cap. Its modern design harmonizes with the surface range outlet No. 7950. Rubber cord sets can be



made up with two No. 6 and one No. 8, two No. 8 and one No. 10, or three No. 6 wires, where it is permissible to use the neutral wire as a ground. The Arrow-Hart & Hegeman Electric Co., Hartford, Conn.

ELECTRICAL WARNING SIGNALS AND SIRENS



Type A Siren

Designed for factories, industrial plants, warehouses and cranes. Can be used as a Danger, Start and Stop or as a Call Signal. TYPE "A" Siren takes the place of bells, gongs, whistles, etc., wherever electricity is available. Louder than any bell or gong. Is ideal for factories and plants or yards. Its powerful tone will penetrate through shop or factory. Illustration shows Type "A" Siren with weatherproof housing. Universal General Electric Motor, for AC or DC, any phase or cycle. Any voltage desired from 6 to 250. Length over all 14 in. Diameter largest horn 10 in. Red Duco finish. Write for Bulletin No. 42 on Industrial Signals.

A NEW SIGNAL USED IN SHOPS AND PLANTS EVERYWHERE

SIGNA-KALL



Signa-Kall

The Federal SIGNA-KALL has provision for 30 separate codes, to call any of 30 different people. Each call is repeated one, two or three times automatically. Located at switchboard, and connected into the signal system, gives instant signals to superintendents, foremen, plant managers and executives. This Kall can be used on any kind of signal system using any kind of current. The make and break contacts of the SIGNA-KALL are rated at 100 watts at 110 volts. The Federal SIGNA-KALL comes complete with cord and connector, ready to install.

Write for Bulletin on INDUSTRIAL SIGNALS.

FEDERAL ELECTRIC COMPANY

8726 South State St. Chicago, Ill.

HERWIG

OUT-DOOR LIGHTING FIXTURES



Apartment Buildings
Public Buildings
Bungalows
Churches
Schools
Garages
Country Clubs
Warehouses
Residences

A FIXTURE FOR EVERY OUTDOOR PURPOSE

Cast Iron or Bronze

Send for our

Catalogue No. 30

200 Illustrations

The Herwig Company

MANUFACTURERS

Established 1908

1753-59 Sedgwick Street

Chicago, Illinois, U. S. A.

Be Sure to Send for

A SET OF SHEETS SHOWING NEW NUMBERS

tag upon which a diagrammed code has been printed. The measurements that accompany the diagrams have been computed on the use of this company's bending tools. It is claimed that the detailed instructions enable wiremen to gauge bends perfectly, thus eliminating guess work, and resulting in a neater appearing installation.

Residence Lighting: "Light in the Home," 64 pages with gravure illustrations. Arranged in five parts covering the principles of lighting; lighting the home room by room; holiday lighting; an explanation of wiring, circuits, fuses, outlets and meters in lay terms; and the art of making lamp shades at home. This handsome booklet has been dedicated to the women of America who are making their homes more attractive, more comfortable and happier. Westinghouse Lamp Company, 30 Rockefeller Plaza, New York, N. Y.

Electron Tubes: Three publications on theoretical and experimental electronics and electron-tube applications have now been made available to the public at a nominal charge by the General Electric Co., Schenectady, N. Y. 'Electronics and Electron Tubes," designated as publication GET-568-A, is priced at 25 cents. It was written in response to requests from schools and colleges for a publication giving the fundamentals underlying the vacuum tube, and including experiments to illustrate these fundamentals. References are included which enable the reader to delve more extensively into many subjects treated in the 48-page booklet. The other two publications, GET-566 and GET-620, deal with laboratory experiments on electron-tube theory and on electron-tube applications, respectively. The two booklets are obtainable for 25 cents. Address: Educational Section, General Electric Co., Schenectady, N. Y.

Trade Notes . .

Wolverine Tube Co., Detroit, Mich., announces the appointment of the Power-Jones Sales Co., Cleveland, O., as its sales representative in the Ohio territory.

Simplet Electric Co., Chicago, Ill, announces the appointment of H. R. Vaughan, 3138 Schubert Street, Cincinnati, O., and Henry F. Yost Co., 1264 Folsom Street, San Francisco, Calif., as its representatives.

The Arrow-Hart & Hegeman Electric Co., Hartford, Conn., announces the opening of a new southwestern district office at 2403 South Harwood Street, Dallas, Texas. Wynn Snoots, who has covered the southwestern territory for the past five years has been made manager and will have charge of sales in Texas and Arkansas.

TIPS ON FAN INSTALLATION



There is a fine opportunity in every community to sell profitable installations of BREEZO ventilating fans. In order to make the most money and give the customer an installation which will please him—you must know HOW to install these fans properly.

This Booklet TELLS HOW!

Send for your copy today.

USE THIS COUPON

Buffalo Forge Company
491 Broadway, Buffalo, N. Y.

Gentlemen:
I'd like to install more ventilating fans. Send me the booklet.

.....

.....

.....

UMI

NORTHWESTERN



AUTOMATIC TIME SWITCH

The switches may be operated by hand at *any time*, without disturbing the time set to operate. Just the clock for show windows on dark days.

Self-starting Synchronous Motor

Single Pole 20 or 40 amp., $12.00

Double Pole 20 or 40 amp., $14.00 f.o.b. Omaha

WRITE FOR BULLETIN 64

NORTHWESTERN CLOCK CO.
514 BROWN BUILDING, OMAHA, NEB.

LESS DRILLING and

More Powerful Anchorage are important factors on every job that requires the fastening of Electrical Equipment to concrete or masonry—You get these advantages with



HILTI

EXPANSION NUTS
(Machine Screw Anchors)
made in all sizes, long, short, and closed end.
Setting tools with every order.

SEND FOR FREE SAMPLES AND ATTRACTIVE PRICES.

CHICAGO EXPANSION BOLT CO.
128 S. Clinton St. Chicago, U. S. A.

To Cut Thin-Wall Conduit SQUARE Use the Beaver Square-End Sawing Vise



No. 2
¾ to 2"
$5.00

No. 4
1½ to 4"
$15.00

No. 2 is aluminum; No. 4 malleable iron. Both are self-contained—and simple to use with a standard hack saw. Renewable inserts. Through your jobber. Write us for complete catalog.

Beaver Pipe Tools, Inc., Warren, Ohio



"Standardize on **STANDARD** *Transformers"*

•

ALL TYPES
Indoor and Outdoor Service

•

Send for Descriptive Bulletin

•

STANDARD TRANSFORMER CO.
Warren - - - - - - Ohio

Advertisers' Index

A

Allen-Bradley Co. 59
Aluminum Co. of America 57
American Brass Co. 52
American Steel & Wire Co. 69
Arrow-Hart & Hegeman Electric Co., The 71

B

Beaver Pipe Tools, Inc. 84
Boston Woven Hose & Rubber Co. 42
Bright Light Reflector Co. 77
Bryant Electric Co. 33, 34, 35, 36
Buffalo Forge Co. 83
BullDog Electric Products Co. 37
Burndy Engineering Co., Inc. 74
Bussmann Manufacturing Company 41

C

Central Porcelain Co. 48
Ceramic Specialties Co. 48
Chase-Shawmut Co. 30
Chicago Electrode Laboratories 84
Chicago Expansion Bolt Co. 84
Continental-Diamond Fibre Co. 76
Crescent Insulated Wire & Cable Co. 40
Cutler-Hammer, Inc. 38, 39

D

Dayton Rubber Mfg. Co. 63

F

Fairbanks, Morse & Co. 61
Federal Electric Co. 83
Fullman Mfg. Co. 77

G

General Electric Co. Inside Front Cover, 31, Back Cover
Graybar Electric Co. 4
Greenlee Tool Co. 47
Gwilliam Mfg. & Supply Corp. 84

H

Henderson-Hazel Corp. 72, 73
Herwig Co. 83

I

Ideal Commutator Dresser Co. 49
Illinois Electric Porcelain Co. 48, 76
International Association of Electrical Inspectors 50
Irwin Auger Bit Co. 74

J

Jefferson Electric Co. 55

K

Kelso Burnett Electric Co. 56
Knox Porcelain Corp. 48

L

LaSalle Hotel 70

M

Mark & Co., Clayton 46
McGill Manufacturing Co. 70
McGraw-Hill Book Co., Inc. 78
Minerallac Electric Co. 74
Multi Electrical Mfg. Co. 76

N

Northwestern Clock Co. 84

O

Ohio Carbon Co. 56
Okonite Company, The 75

P

Porcelain Products, Inc. 48

Q

Quadrangle Manufacturing Co. 62

R

Reliance Automatic Lighting Co. 32

S

Sangamo Electric Co. 43
Sherman Mfg. Co., H. B. 76, 78
Signal Electric Mfg. Co. 74
Smoot-Holman Co. 51
Square D Company ..... Inside Back Cover
Standard Electrical Porcelain Mfrs. 48
Standard Transformer Co. 84
Steel City Electric Co. 79
Superior Porcelain Co. 48

T

Trumbull Electric Mfg. Co., The. 44, 45

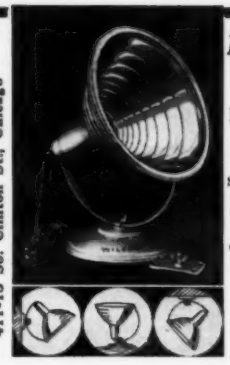
U

United States Rubber Co. 2, 60
Universal Clay Products Co. 48
Victor Electric Products, Inc. 78

W

Weiss & Biheller Merchandise Corp. 84
Westinghouse Electric & Mfg. Co. 79
Wilson Lighting, Inc. 84
Wiremold Co., The 54
Youngstown Sheet and Tube Company, The 67

WILSON LIGHTING INC.
411-13 So. Clinton St., Chicago



NEW—
No. 670 Indoor Floodlight
$1.89 ea
Std. Pkg. Net Price to Contractors

•

Complete with
- Two bases: Portable and screw-down.
- Porcelain socket.
- Asbestos cord.
- Color Holder and Colors.

Send for New 1936 Catalog

CONEX



UNIVERSAL SOLDERLESS WIRE CONNECTOR



No Solder—No Tape—No Dirt.

Smaller than competing products, yet takes same combinations of wires. Removable rustless cadmium plated insert. Underwriters approval. Pats. Nos. 1678752, 1780985.

WEISS & BIHELLER, Inc.
584 Broadway New York City

Specializing in



ALL THREAD CONDUIT
Made from Enameled Conduit. Standard sizes in stock—special to order.



GALVANIZED CONDUIT REDUCER
A very useful fitting. All sizes from 4x3½ to 1x¾ in.
Write for complete details and prices.

• GWILLIAM •
Manufacturing & Supply Corp.
4417 North Sixth St., Philadelphia, Pa.

NEON?

COMPLETE PLANT INSTALLATIONS also SPECIALIZING in:

Electrodes	Neon
Elevation Posts	B-10 Gauges
Housings	Glass
Transformers	Pumps
G. E. Cable	Bombarders
Mercury	Stop Cocks

If you are planning to install a Neon plant, or have any Neon problems, feel free to write R. A. Warren (internationally known as a pioneer in the Neon industry).

CHICAGO ELECTRODE LABORATORIES
Dept. A-12 St. Charles, Ill.

a *New* line of range switches with the SQUARE D swing-out interior and a NEW ventilated FUSE [D]-BREAK



Here is a definite time-saver in range switch installations.

In the conventional range switch only about 30% of the box area is usable for attaching conduit and pulling the wires.

With the new Square D Swing-Out Interior, 100% of the box area is available—there are no sharp copper connectors or other parts to skin knuckles.

The range and main fuse carriers have actually super features. They are fool-proof. Porcelain guides insure proper alignment and positive contact reduces heating.

Heat from the fuses is carried off through ventilating slots in the FUSEDBREAK cover. Furthermore, the new Square D FUSEDBREAK is dead front and all live parts are recessed.

This new Square D range switch cuts wiring costs and adds profit to your work. It will appeal to power companies by reducing service calls caused by overheating of fuses.

See this new switch in Square D distributors' stocks. Have them explain its advantages to your power companies.

SQUARE D COMPANY

DETROIT MICHIGAN U.S.A. MILWAUKEE WISCONSIN

SQUARE D COMPANY, INC., LOS ANGELES, CALIFORNIA
SQUARE D COMPANY CANADA LTD. TORONTO, ONTARIO

SQUARE D

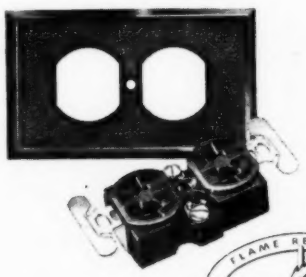
CALL IN A SQUARE D MAN

UMI

Look into the future



Before you start a wiring job, consider the future. The customer—new or old—is going to have other electrical work done some time. And it is the product service that usually determines whether you are selected to do more work for that customer six months, a year or five years from now. The product must give long dependable service. Use reliable General Electric Wiring Materials. Guarantee customer satisfaction. Be sure of obtaining present and future business.



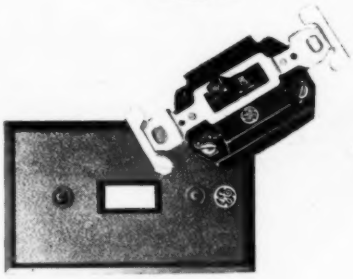
G-E "Safecote" Code Wire provides lasting electrical service. It is economical for you to install.

FLAME RETARDING
SAFE COTE
MOISTURE RESISTING

For convenience, control and appearance, use G-E Switches, Convenience Outlets, and Plates. They are made of durable, good-looking brown Textolite. They are available in many types.



These General Electric Products insure future business . . . build profits. They are dependable quality products, at economical prices. Send for complete information now. Write Section DW-489, Merchandise Department, General Electric Company, Bridgeport, Connecticut.



GENERAL ELECTRIC

WIRING MATERIALS

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

UMI

UMI